Annual Report of the Ministry of Forests

for the fiscal year ended March 31, 1991

Province of British Columbia
Ministry of Forests

Honourable Dan Miller, Minister

92-04953/

January 31, 1992

Lieutenant-Governor of British Columbia in Council
Parliament Buildings
Victoria, British Columbia

May It Please Your Honour:

Herewith I respectfully submit the Annual Report of the Ministry of Forests for the fiscal year ended March 31, 1991.

Dan Miller
Minister of Forests

January 30, 1992

The Honourable Dan Miller
Minister of Forests
Parliament Buildings
Victoria, British Columbia

Sir:

I have the honor to submit the Annual Report of the Ministry of Forests for the fiscal year ended March 31, 1991.

P.G. Halkett

Philip Halkett
Deputy Minister
Ministry of Forests

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I. The Ministry of Forests

Prologue

The Ministry of Forests manages and protects the province's forest and range resources for the best balance of economic, social and environmental benefits to British Columbians, now and in the future.

The ministry has the mandate for the resource stewardship for provincial forests, which cover 85 per cent of the province.

These forests have a greater diversity of forest types than the forests of any other jurisdiction. They are managed for range, recreation, wildlife, fisheries, water, aesthetic, and other social values.

Only about a quarter of the province is managed as commercial forest — managed for a balanced mix of these values, along with the growing and harvesting of timber.

Each year, timber is harvested from about one per cent of the commercial forest. This harvest sustains the $11.5-billion forest sector, which is the main driver of the province's economy and represents about $8,000 for every B.C. household.

Rapidly changing social values require a continuing revision of the ministry's management plans to meet the public's many and often conflicting demands.

The ministry's challenge, as steward of the province's forests, is to continue to ensure the best possible balance of economic, social, and environmental benefits to all British Columbians.

Legislative authority

The *Ministry of Forests Act* [Section 4] states the mandate. It is to:

"a. encourage maximum productivity of the forest and range resources in the Province;

b. manage, protect and conserve the forest and range resources of the Crown, having regard to the immediate and long-term economic and social benefits they may confer on the Province;

c. plan the use of the forest and range resources of the Crown, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are co-ordinated and integrated, in consultation and co-operation with other ministries and agencies of the Crown and with the private sector;

d. encourage a vigorous, efficient and world competitive timber processing industry in the Province; and,

e. assert the financial interest of the Crown in its forest and range resources in a systematic and equitable manner."

Responsibilities and authorities are defined in:

- *Ministry of Forests Act*, Revised Statutes, 1979, Chapter 272;
- *Forest Act*, Revised Statutes, 1979, Chapter 140;
- *Range Act*, Revised Statutes, 1979, Chapter 355; and,
- *Forest Stand Management Fund Act*, 1986, Chapter 8.

The ministry has administrative responsibility for the *Foresters Act*, Revised Statutes, 1979, Chapter 141. An additional statute that affects the ministry is the *Boom Chain Act*, Revised Statutes, 1979; Chapter 33.

Commitment to corporate goals

To implement its mandate, the ministry has made a corporate commitment to:

- grow healthy, productive forests to meet the province's social and economic needs;
- provide forest recreation and manage wilderness values in provincial forests;
- manage and protect Crown forest lands so as to ensure sustainable development of:
  - timber for the forest industry; and,
  - forage for the livestock industry and wildlife;
- ensure the province receives proper resource revenues from Crown forests and range;
- encourage a vital, efficient, and world-competitive wood-processing industry;
- ensure reforestation of Crown forest lands;
- conduct research in forest renewal, forest productivity and decision support aids, and integrated resource management;
- protect the province's forest and range resources from damage by fire, forest insects and diseases;
- maintain a current and accurate inventory of forest and range values;
- inform various audiences about the ministry's mandates, goals, organization, policies, programs, products, services and achievements; and,
- ensure the best balance of all these resource values through integrated resource management.

Integrated resource management is a process which:

- identifies and considers all resource values;
- considers social, economic, and environmental needs and objectives;
- assigns resource-use and management emphasis based on:
  - analysis of the relative merits of various resource uses and objectives;
  - the land's capabilities;
- is guided by the principles of sustainable use and resource stewardship; and,
- plans resource uses for the present and schedules resource-use changes over time.

To achieve integrated resource management, the ministry will:
- fairly and equitably consider social, economic and environmental factors;
- adopt a client orientation focusing on solving problems of client groups; and,
- provide participation and consultation opportunities.

Corporate values

The ministry's corporate goals are to:
- maintain a commitment to get results, through effective programs and financial responsibility, and to maximize job opportunities;
- encourage public and private sector participation in determining and achieving ministry objectives;
- respond to client needs through efficient, timely and courteous service and decentralized responsibility and accountability; and,
- develop innovative and entrepreneurial management, through staff development, with emphasis on excellence.

Reports

The *Ministry of Forests Act* requires these reports to be prepared:
- a periodic analysis of the conditions, management, and future uses of the forest and range resources to enable the setting of overall priorities and long-term objectives;
- a five-year program updated annually, which sets schedules, methods and priorities for forest and range resource management and improvement; and,
- an annual report on the ministry's programs and activities, including money spent and information on whether the resources entrusted were well-managed and value was received for money spent.

The Ministry's Structure

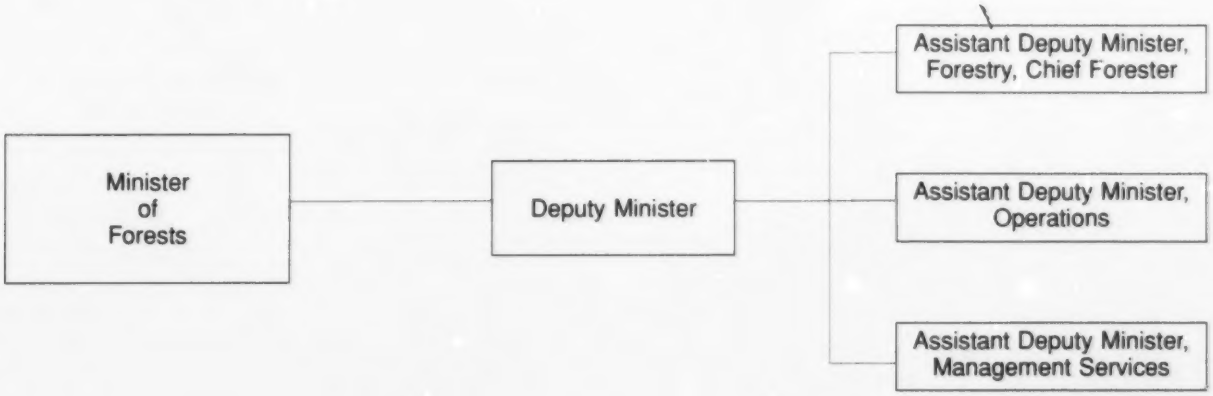
The ministry is structured to:
- manage the resources more effectively;
- decentralize decision-making to ensure efficient and highly responsive service to ministry clients;
- emphasize integrated resource management and forest product development and marketing;
- establish clear line-staff relationships;
- ensure accountability of managers;
- achieve excellence through a commitment to employees; and,
- emphasize contracting of services and an audit approach to management.

Headquarters organization

The headquarters staff has three divisions:
- Forestry;
- Operations; and,
- Management Services.

As shown in the organizational chart below, each division is headed by an assistant deputy minister. These three officials, together with the deputy minister as the chair, constitute the ministry's executive.

Four branches of the ministry, headed by directors, report directly to the deputy minister. They are:
- Industry Development and Marketing;
- Public Affairs;
- Valuation; and,
- Policy and Planning.


Minister of Forests
Deputy Minister
Assistant Deputy Minister, Forestry, Chief Forester
Assistant Deputy Minister, Operations
Assistant Deputy Minister, Management Services

Forestry Division

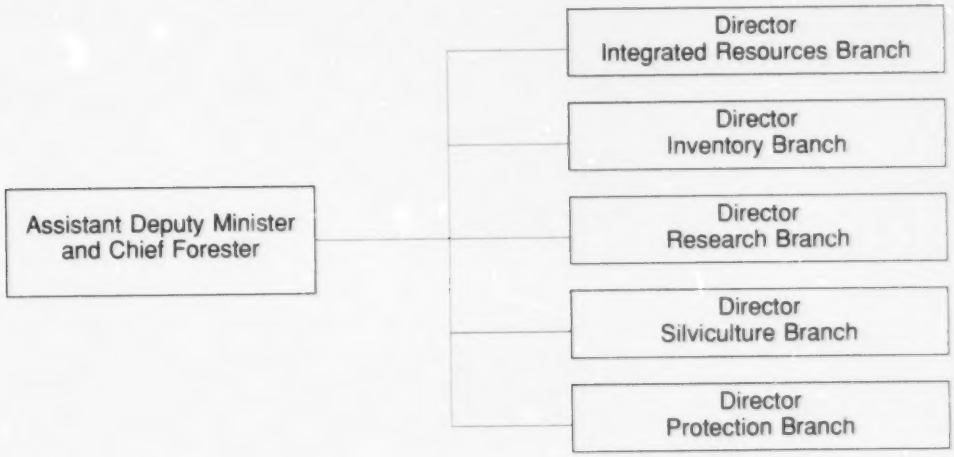
The Forestry Division ensures all Crown forest lands are managed to provide the greatest long-term benefits for British Columbians.

The assistant deputy minister of this division is also the chief forester.

The Forestry Division is composed of the following branches:

- Integrated Resources;
- Inventory;
- Research;
- Silviculture; and,
- Protection.

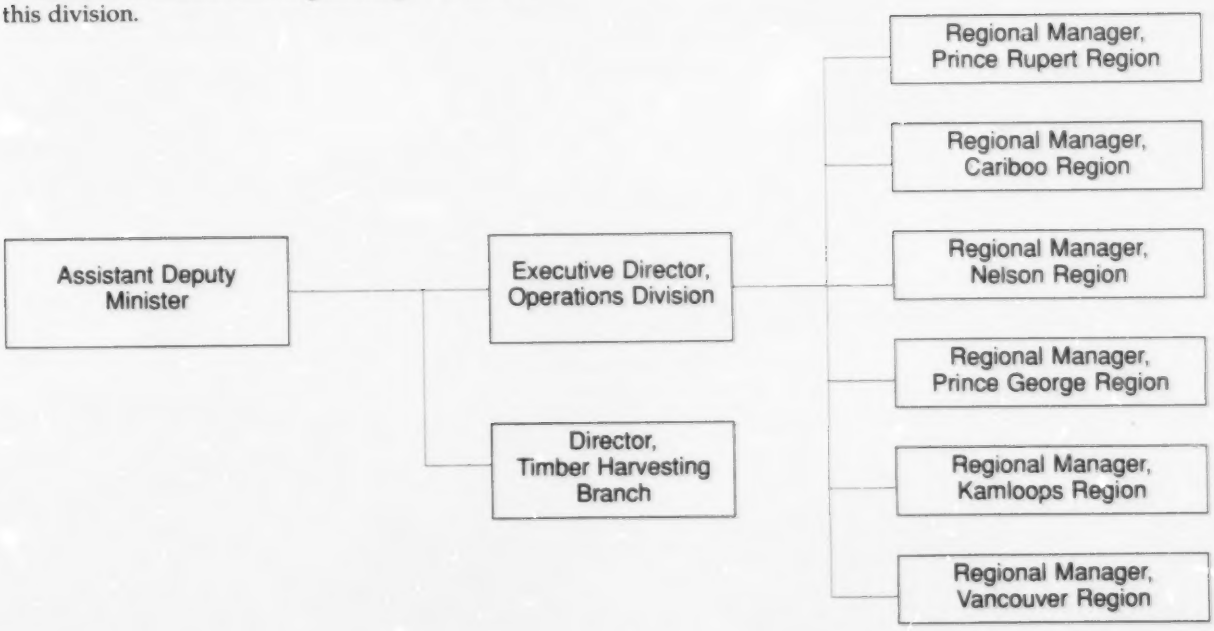
Each branch is headed by a director. The director of the Integrated Resources Branch is also the assistant chief forester.



Operations division

The operations division oversees the ministry's regional and district offices.

The Timber Harvesting Branch with two sections — Timber Allocation and Engineering — is also in this division.


Assistant Deputy Minister
Executive Director, Operations Division
Director, Timber Harvesting Branch
Regional Manager, Prince Rupert Region
Regional Manager, Cariboo Region
Regional Manager, Nelson Region
Regional Manager, Prince George Region
Regional Manager, Kamloops Region
Regional Manager, Vancouver Region

Regional organization

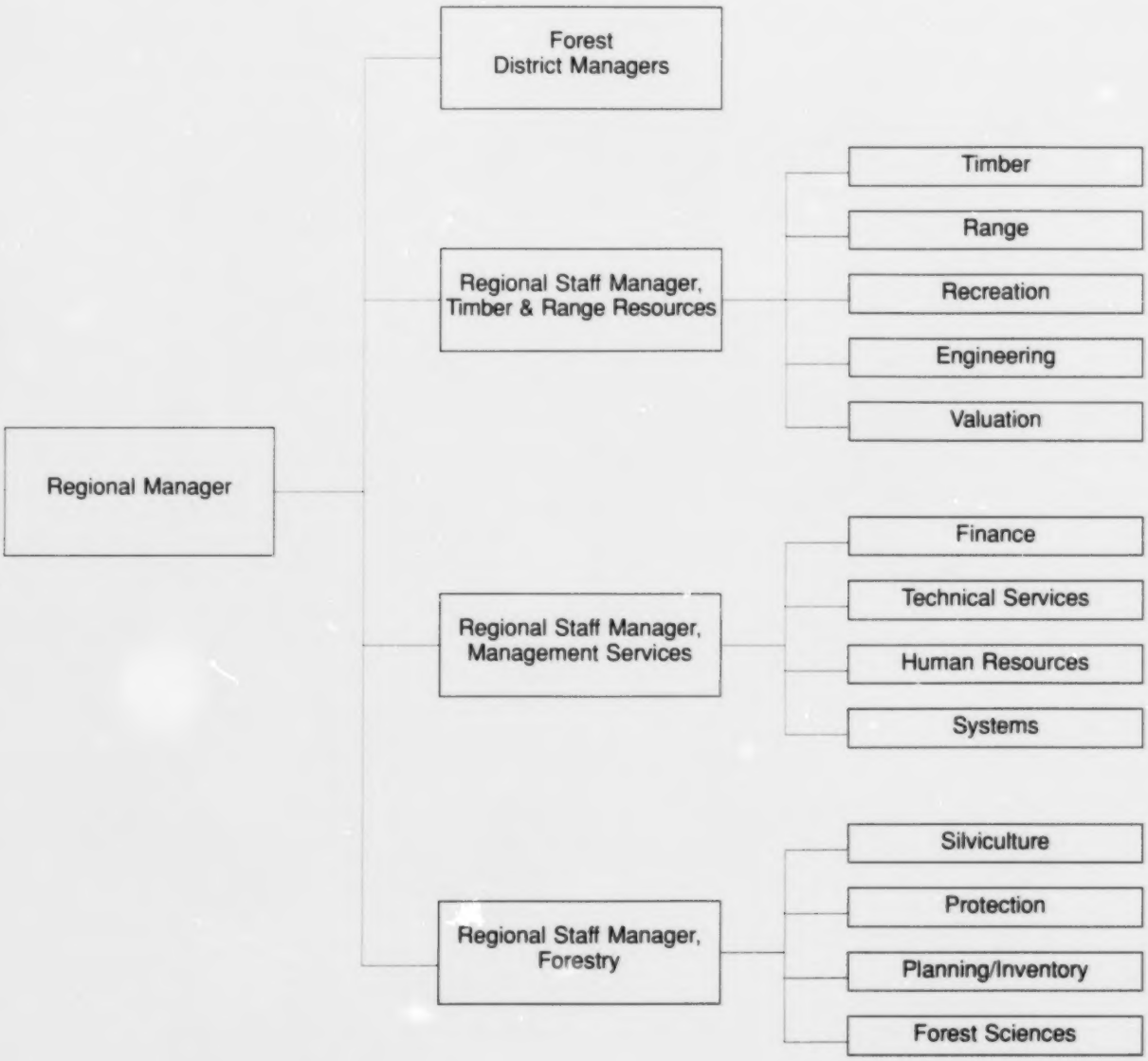
The province is divided into six forest regions for administrative purposes, with each forest region subdivided into forest districts. Each region has a regional manager.

The organization of a forest regional office is shown below.

Three regional staff managers — for forestry, management services, and timber and range resources — provide advice and services to each regional manager and to the various district managers who report to the regional manager.

Regional office personnel are responsible for servicing, coordinating and monitoring the activities of all field personnel operating out of district offices.

The staff of each regional office develop regional programs and plans, and ensure all policies, programs and procedures originating from ministry headquarters are administered consistently and effectively throughout the region.

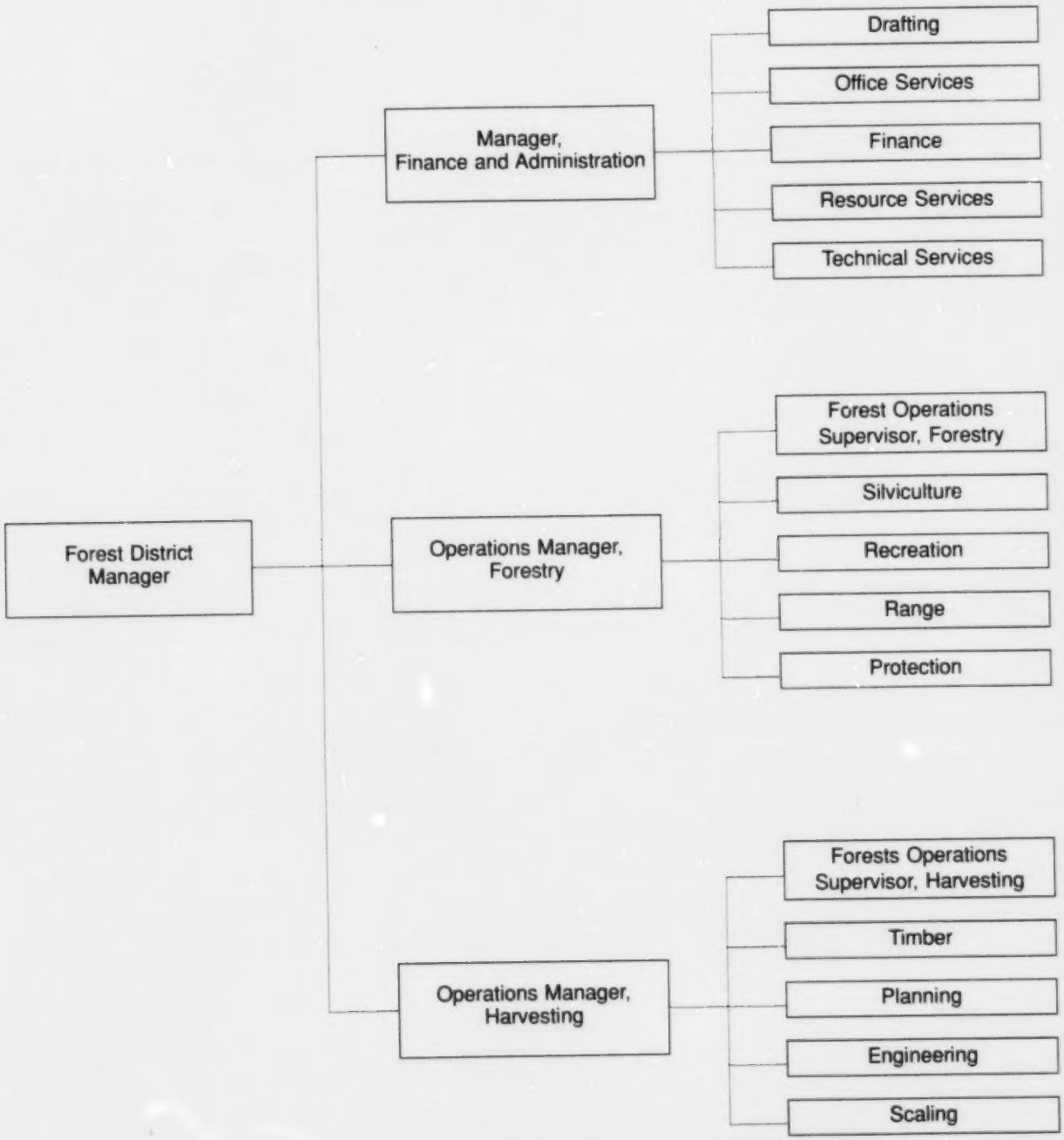


District organization

The province is divided into 43 forest districts, each administered from its own district office by a district manager. Some districts also administer field offices.

The organization of a forest district office is shown below.

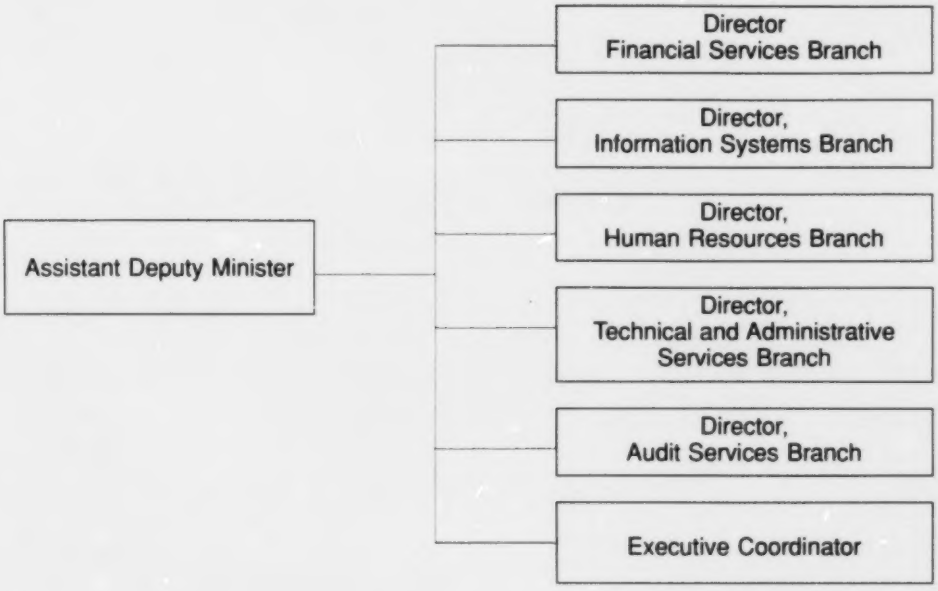
Three district staff managers — for harvesting, forestry, and finance and administration — provide advice and services to each forest district manager.



Management Services Division

The Management Services Division is comprised of an executive coordinator and five branches, each headed by a director:

- Financial Services;
- Information Systems;
- Human Resources;
- Technical and Administrative Services; and,
- Audit Services.



II. Program reports

Introduction

For convenient comparative reading, the program reports follow, as closely as possible, the structure of the government's Estimates for the 1990–1991 fiscal year.

The *Estimates* for the ministry include:

- Vote 30: Minister's Office;
- Vote 31: Ministry Operations;
- Vote 32: Fire Suppression Program;
- Vote 33: Forest Renewal;
- A statutory special account for the Small Business Forest Enterprise Program;
- A statutory special account for South Moresby Implementation; and
- A statutory special account for the Sustainable Environment Fund.

The program reports focus on five of the above:

- Ministry Operations;
- Fire Suppression Program;
- Forest Renewal Program;
- The Small Business Forest Enterprise Program; and,
- South Moresby Implementation Account.

Ministry Operations — Vote 31

The sub-votes (programs) are:

- Management Services:
  - senior executive direction and co-ordination of central ministry services, including personnel, finance, audit, systems, accommodation, communications, technical services — *Management Services* (*page 8*);
  - Public Information and Library Services (*page 10*);
  - regional and district program administration in areas of personnel, finance, systems and technical services — *Management Services* (*page 8*);
  - grants are provided for activities which promote the forest industry — *Management Services* (*page 8*); and,
  - Policy and Planning (*page 12*).
- Harvesting (*page 13*);
- Industry Development and Marketing (*page 15*).
- Research (*page 17*);
- Forest Protection (*page 19*);
- Integrated Resource Management (*page 21*); and,
- Inventory (*page 23*).

Fire Suppression Program — Vote 32

This program (*page 24*) funds the fighting and extinguishing of forest and range fires and includes related ex gratia payments.

The sub-votes are:

- Direct Fire-fighting; and,
- Fire Suppression Preparedness.

Forest Renewal — Vote 33

This vote (*page 25*) funds ministry silvicultural and forest renewal initiatives and includes:

- Silviculture Administration; and,
- Forest Renewal Programs (*page 26*).

Special Accounts

- Small Business Forest Enterprise: this program (*page 34*), funded by a special account (*Table L-1*), was established by an amendment to the *Forest Act* in 1988;
- South Moresby Implementation (replacement and compensation) (*Table M-1*): this account was established by the *South Moresby Implementation Account Act* in 1988; and
- Sustainable Environment Fund (*Table K-1*): this account was created by the *Sustainable Environment Fund Act*, 1990.

Management Services

Program description and goals

The program's goals are to:
- provide executive direction and co-ordination of the ministry's administrative support services for the effective management of the ministry's human, financial, information, and physical resources;
- maintain and enhance the ministry's integrity, reputation, and trusted relationships with central agencies;
- contribute to the improvement and practicality of central agencies' systems and requirements;
- provide support services for all resource programs at the regional and district levels in the area of finance, personnel, information systems, administrative, and technical services; and,
- provide grants to agencies involved in forestry research and the promotion of forest management.

The program's various parts include:
- financial services: to provide financial policies, procedures, training, and direction to ensure high standards of financial management;
- human resources: to provide quality, integrated, staff services through human resource planning, training, development, recruitment and selection, occupational health and safety, labor relations, and employment equity initiatives, which are consistent with the *Public Service Act* and the *Public Service Labour Relations Act*;
- technical and administrative services: to provide a comprehensive range of technical and specialized administrative services for the effective management of the ministry's facilities, vehicles, equipment, assets, radio communication systems, and administrative functions;
- information systems: to provide effective and efficient computer information systems for the ministry's operations and access to other government systems;
- legal services: to co-ordinate all appeals and compensation claims under the *Forest Act* and *Range Act* and to advise ministry officials on legal matters or interpretation of legal documents; and,
- audit services: to support management in fulfilling its responsibilities by providing independent and objective analyses, evaluations, and recommendations on those programs and activities reviewed.

Client situation

The program's clients are:
- the ministry's executive, managers, and employees;
- the provincial government's central agencies;
- the public;
- the forest and ranching industries; and,
- agencies involved in forestry research and in the promotion of forest management.

Activities

During 1990–91, work continued under the program to:
- simplify and improve the productivity and integration of the financial management policies, systems, and processes;
- upgrade employees' skills and to ensure availability of skilled staff through a major recruitment initiative;
- promote employment equity;
- increase the effectiveness of the audit function by undertaking more value-for-money audits and assessing controls in systems development;
- undertake a major redevelopment of the ministry's revenue-management policies, business practices, and systems;
- expand, upgrade, and give district offices greater access to information systems to enable them to better meet the ministry's business needs; and,
- provide expert advice to ministry officials on legal, financial, and technical matters.

Other activities included:
- the operation of six forest regional offices — in Vancouver, Prince George, Smithers, Williams Lake, Kamloops and Nelson — which provided:
  - the development of regional programs and procedures from broad provincial policies;
  - corporate direction, and professional and technical expertise to assist forest districts in implementing ministry programs; and,
  - the auditing and monitoring of the performance of districts;
- the operation of 43 forest district offices, which were involved in:
  - the delivery of the ministry's programs; and,
  - revenue collection and reporting;

  and,
- extending grants to:
  - the Festival of Forest Society; and,
  - the B.C. Forest Museum.

Expenditures

Forecast expenditures were $100.0 million. Actual expenditures were $99.9 million. The major expenditure was $39.3 million for technical and administrative services. (Table B-1).

Effects on clients

This program enhances and promotes the efficient delivery of the resource programs and ensures that statutory requirements are met (example: *Financial Administration Act, Worker's Compensation Act*).

The program also provides grants to various forestry agencies.

Forecasts

Effective stewardship of geographic and financial information is required for success in the ministry's key role of forest and revenue management. Investments in information systems will be required to meet this challenge.

Public Information and Library Services

Sub-program description and goals

This sub-program, funded under the Management Services Program, co-ordinates the communication of information on the ministry's mandate, goals, organization, policies, programs, products, services, and achievements to:

- staff (internal);
- the public (external), including:
  - organized groups and associations;
  - the news media;
  - the forest industry;
  - forest professionals;
  - other government agencies;
  - opinion leaders; and,
  - universities, colleges and schools.

It also provides:

- an information resource service to staff and the public; and,
- consultation and advice to staff on communicating information, internally and externally, on the forest and range resources, the ministry's forest and range programs, and forest and range issues.

Client situation

Public concern on the impacts of clearcutting and the harvesting of old-growth trees increased as local, continental and international news outlets focused attention on specific areas in the province. Public comments and requests for information on forest management issues reflected this increased concern.

Activities

Communication Plan
The ministry's annual communication plan was developed, co-ordinated, implemented and evaluated.

Print communications
More than three dozen publications on various topics were printed or reprinted and distributed to all ministry offices, for dissemination to the public and to target audiences.

Backgrounder fact sheets were also produced dealing with major local land-use issues.

A major initiative was the completion of a comprehensive booklet and a summary pamphlet titled *All Things Considered — Forest Management in British Columbia*.

Also published were three new full-color posters — on silviculture systems, silviculture and reforestation — under the *All Things Considered theme, the Five-Year Forest and Range Resource Program 1991-1996*, publications on the $1.4-billion Forest Renewal Program 1991-1996, the ministry's annual report, an internal newsletter, public discussion papers, forest protection and fire suppression posters, and recreation site maps.

Media relations
More than 175 news releases, guest editorials, statements from the minister, and letters to the editor were distributed to the media, besides responding to numerous requests for information.

Visual/electronic communications
A video titled *All Things Considered — Forest Management in British Columbia* was developed and focus tested for use in schools and for public screenings. The video will be part of an educational kit, which will include the booklet and the pamphlet of the same title.

A video and a display were also produced for the 'Parks and Wilderness for the '90s public information sessions held throughout the province on the proposals by the Ministry of Parks and the Ministry of Forests for expanding the province's provincial parks and forest wilderness areas.

Advertising
Newspaper and radio ads were placed to:

- invite the public to official openings of new ministry facilities and open houses during National Forest Week at forest regional and district offices in many communities throughout the province; and,
- fire prevention radio ads were updated and distributed to radio stations across the province.

Special events/promotions
Official openings for three new ministry facilities and two promotional events were organized.

Open houses were held at ministry offices throughout the province during National Forest Week.

Public inquiries
A weekly average of 500 phone calls and 45 written and personal requests for information about ministry programs, products, services and publications were serviced.

Library
The ministry's library undertook these activities:

- ordered and catalogued 1,275 new books;
- handled 6,743 reference questions, directory and library material requests;
- loaned out 4,630 items;
- conducted 230 data-base searches;
- obtained 1,059 inter-library loans; and,
- distributed 1,930 reprints.

The library contains 45,000 books and serials and subscribes to 350 journal titles.

Expenditures

Forecast expenditures were $1.8 million under the Management Services program. Actual expenditures were $1.7 million (*Table B-1*). This does not include expenditures for projects implemented with other programs and other agencies.

Effects on clients

Public inquiries and demand for ministry pamphlets, brochures, maps, reports, and other printed material indicated a keen interest in the ministry's programs.

The sub-program's effectiveness was indicated by:

- the news media's use of ministry news releases; and,
- verbal and written responses to newspaper and radio ads.

Positive responses to the ministry's publications, such as *All Things Considered — Forest Management in British Columbia*, videos, special events, and promotions demonstrated that the public viewed the program as necessary, educational, and informative.

Forecasts

Current research indicates the public's interest in forest management in the province will continue to increase along with a demand for more information on evolving issues.

Policy and Planning

Sub-program description and goals

This sub-program, funded under the Management Services Program, provides a staff function to co-ordinate and develop the ministry's:

- corporate planning and policy development;
- policy responses to current issues;
- legislative program; and,
- responses to inter-ministry policy advisory bodies, such as the Forest Resources Commission.

Client situation

The sub-program's clients are primarily the ministry's executive and senior managers.

Activities

During 1990, the activities under the sub-program included the:

- co-ordination of the ministry's liaison with the Forest Resources Commission and the ministry's formal presentation at the commission's hearings;
- co-ordination of the ministry's legislative program, including amendments to the *Forest Act*, and the preparation of next year's legislation;
- facilitation of the start up as well as involvement in Old-Growth Strategy Project;
- preparation of the Five-Year Forest and Range Resource Program, 1990-95;
- initiation of a corporate planning process; and,
- co-ordination of the ministry's contribution to, and review of, various sustainable development initiatives, such as Environment 2001, the federal government's Green Plan, and reports by the B.C. Round Table on the Environment and the Economy.

Expenditures

Expenditures were $0.469 million under the Management Services Program (*Table B-1*).

Harvesting

Program description and goals

The program's main goal is to make timber available to the forest industry, consistent with approved rates of harvest, and in a way that fulfils the ministry's mandate.

This involves a number of activities, including:

- engineering and development of forest roads and bridges;
- acquisition of property;
- issuance of forest tenures;
- harvest plan approvals;
- timber valuation;
- issuance of cutting authority;
- monitoring harvesting operations; and
- billing of Crown charges.

Client situation

The forest industry is the main client under this program. The allowable annual cut on lands regulated by the ministry, as of March 31, 1991, was 74.2 million cubic metres. The harvest from those lands by the forest industry was 62.9 million cubic metres.

Activities

Engineering

Engineering expenditures for 1990-91 totalled $30.1 million (*Tables C-9, C-10, C-11*). About 800 kilometres of new Forest Service roads were constructed bringing the total to 34 952 kilometres (*Table C-9*).

These Forest Service roads provide access to provincial forest and range lands serving industry, small business, tourism, and other interests. They are major public assets.

Road improvement, upgrading and maintenance totalled 6 395 kilometres (*Table C-10*).

The number of bridges and major culverts that are an integral part of the ministry's road network have increased to 3,430 structures (*Table C-11*).

Property acquisition

The ministry acquires property for Forest Service road rights-of-way and other purposes.

During the year, rights-of-way for 87 Forest Service road projects were acquired, involving 98 private properties, at a cost of $1,252,333.

Issuance of forest tenures

Periodically, new forest tenures are issued to:

- use uncommitted timber volumes;
- deal with forest health or fire salvage problems; or,
- provide timber under the Small Business Forest Enterprise Program.

Further, many of the existing major forest tenures are replaceable agreements. The issuance of new and replacement tenures is a continuing activity.

Harvest plan approvals

A major forest tenure holder must go through a comprehensive planning process before a cutting authority can be obtained from the ministry. This process involves ministry approval of plans at four planning levels, each at a greater level of planning detail.

These plans are:

- a Management and Working Plan;
- a Five-Year Development Plan;
- a plan containing the silviculture prescriptions for each cutting area; and,
- a timber harvesting plan.

The ministry judges these plans, which are also reviewed by other resource agencies.

The ministry is also responsible for conducting a similar planning process for tenures sold under its own Small Business Forest Enterprise Program.

Timber valuation

Timber harvested from Crown land is subject to either a royalty or stumpage charges at the time of harvest.

About eight per cent of the annual harvest is subject to royalty rates, which are set by regulation. The remainder of Crown timber is subject to stumpage rates, most of which are determined through site-specific appraisals.

The ministry uses the stumpage appraisal system known as Comparative Value Pricing.

The stumpage rate for each stand of timber is more or less than a pre-set average rate, and depends on whether its value is more or less than the average value of recently harvested timber.

The relative value of each stand is in turn based upon an estimate of the market value of the forest products that can be produced from the timber, coupled with an estimate of the costs typically incurred.

Most stumpage rates are adjusted quarterly to reflect changing lumber markets and changing relative values.

Issuance of cutting authority

Field staff issue a cutting authority — in the form of road permits, cutting permits or Timber Sale Licences — to allow operations to commence only after all plans for the harvesting of timber have been approved.

Monitoring

Ministry staff monitor the harvesting of timber to:

- ensure that laws, policies, and contractual requirements governing timber harvesting are complied with; and,
- provide a basis for remedial action in the case of non-compliance.

Billing of Crown charges
Timber harvested from Crown land and private land is measured, (scaled) and information is recorded on scale returns.

The scale returns are submitted for processing through a computer system — where they are matched with stumpage and royalty rates — to produce scale and royalty invoices.

Some 90,000 scale and royalty invoices are produced each year.

Effects on clients

The timely disposition of timber tenures and approval of cutting authority are essential to allow the forest industry to maximize operational efficiency and profitability.

This, in turn, leads to increased jobs and the maintenance of community stability.

Forecasts

As the public demands on the forest land base increase, program administration becomes more complex.

Increased attention to integrated resource management planning and to field monitoring of harvesting operations can be expected in the coming years.

Forest revenues

Total revenues, including stumpage and royalty, amounted to $573.2 million (*Table 1*).

Stumpage and royalty charges were the main revenue source accounting for $534.9 million.

Stumpage charges for non-competitive licences averaged $7.34 per cubic metre, down one per cent from the previous year (*Table C-2*).

Increased attention to revenue management and control will continue to be a high priority. A number of initiatives are already underway.

Expenditures

Actual expenditures were $52.9 million. (*Table C-1*).

Industry Development

Sub-program description and goals

This sub-program, funded under the Harvesting program, analyses opportunities for maintaining and expanding the forest products industry.

Its goals are to:

- develop policies to promote and enhance the industry's position in manufacturing, product development, and domestic and international trade;
- provide information and liaison services for potential investors;
- propose legislation and related programs to encourage a vigorous, efficient, and world-competitive forest industry; and,
- provide funding for forest products research.

Client situation

The industry began a cyclical downturn in 1990:

- total shipments were $11.5 billion, down by more than 10 per cent from 1989;
- after-tax profits of the publicly traded forest products companies based in the province totalled $135 million, down sharply from the about $650 million earned in 1989 — many companies reported quarterly losses in the last quarter of 1990; and,
- intended capital and repair expenditures for 1990 were $3.3 billion, up from $3.1 billion in 1989.

Lumber

Lumber production decreased by about seven per cent to 14.2 billion board feet.

Prices for spruce-pine-fir 2x4s averaged about US$186 per 1,000 board feet. At year end, the price of SPF lumber was US$162 per 1,000 board feet, down by more than 10 per cent from a year earlier.

The North American lumber market weakened in 1990 as U.S. housing starts declined from 1.4 million to 1.2 million units.

The weakness in the North American lumber market was partially offset by the continuing strong performance of offshore markets, such as the European Economic Community.

Pulp

Market kraft pulp shipments were down by 15 per cent to 3.5 million tonnes.

Pulp markets were weak during 1990, and despite extensive downtime by producers, the price for northern, bleached, softwood, kraft pulp decreased to about US$750 per tonne by year end, down significantly from US$840 per tonne a year earlier.

Newsprint

Newsprint production increased by five per cent to a record level of 1.8 million tonnes.

A strike affecting eastern Canada producers helped maintain a relatively firm market for B.C. producers during part of 1990.

At year end, newsprint prices were about five per cent higher than a year earlier.

Plywood

Plywood production was 1.6 million cubic metres (about 1.9 billion square feet, 3/8-inch basis), down about 10 per cent.

More than 80 per cent of the plywood produced is used domestically.

Canadian housing starts in 1990 were 182,000 units, about 15 per cent less than the previous year.

Shakes and shingles

Exports of shakes and shingles, more than 90 per cent of which go to the U.S., increased by five per cent.

The 35-per-cent duty imposed by the U.S. in June 1986 is being reduced in stages over a five-year period. During 1990, the duty rate was 10 per cent. The duty was scheduled to be removed by mid-1991.

Value-added wood products

In recent years, the industry, with encouragement from government, has begun programs to encourage value-added processing in the wood products industry.

Jointly-funded programs have wide support throughout the industry. The objectives of these programs are to:

- develop market and technical information;
- promote B.C.-made, value-added wood products;
- participate in regional and international trade shows and missions; and,
- encourage improved use of the wood resource.

Activities

The program's activities included:

- meeting with investors to explore opportunities in the forest products industry;
- reviewing proposals for new forest licences and a pulpwood agreement;
- providing economic advice and analysis of forestry-related issues;
- making presentations at seminars and trade conventions;
- funding support for wood-products research;

- reviewing forestry projects under the Major Project Review Process;
- reviewing trade issues affecting the forest products industry;
- publishing and distributing a directory of wood-processing plants in the province; and,
- co-ordinating and funding two studies on residues disposal from wood-processing plants.

Expenditures

Expenditures were $3.7 million (*Table C-1*). The major expenditure was $2.8 million to support wood products research.

Effects on clients

The industry is:
- investigating the large-scale use of previously considered non-commercial tree species;
- actively developing new manufacturing processes to encourage value-added processing and better use of the resource; and,
- broadening its market base by promoting its products world-wide.

Forecasts

The efforts to diversify markets, broaden product mix, and improve timber-use technology will help the industry to take advantage of new opportunities for wood products and moderate its current cyclical nature.

Research

Program description and goals

The program addresses complex forest resource management issues by providing research support to achieve the ministry's operational goals and transferring research findings into operational practice.

The goals are:

- forest renewal research: to develop techniques and guidelines to cost-effectively restock forest sites so that:
  - future wood supplies are available; and,
  - other resource values are protected.
- forest productivity and decision-support research to:
  - provide managed, stand-yield tables for use in determining the allowable cut and selecting optimal silviculture regimes; and
  - develop decision-support tools to assist forest managers in making the best strategic and operational decisions; and,
- integrated resource management research: to address key forest and range resource problems, taking into consideration the impact of forestry practices on:
  - wildlife and fish habitats;
  - old-growth forests;
  - biodiversity;
  - climate;
  - soils;
  - hydrology;
  - recreation; and,
  - the visible landscape.

Client situation

Programs are guided by client advisory committees, tree improvement and forest productivity committees, and nursery technical committees.

Many co-operative projects are underway with the forest industry and other academic, research, and federal and provincial institutions throughout the province.

Activities

Forest renewal research

The following activities were undertaken:

- deoxyribo nucleic acid (DNA) probes were developed to identify hybrid spruce species parentage in the Nass and Skeena valleys;
- studies of western larch and white pine management in seed and breeding orchards were started;
- a problem analysis was completed on research needs in silviculture systems;
- a pollen management workshop was held and a manual was prepared for ministry and industry clients; and,
- studies of root form and development in 10- to 15-year-old plantations were started.

Forest productivity and decision-support research

The following activities were undertaken:

- new research on stand growth and development was conducted on the dynamics of mixed species and the impact of rot on yield;
- interim-managed stand-yield tables were produced for western hemlock;
- data for Sitka spruce, lodgepole pine, and white spruce were summarized and analysed for the calibration of stand models;
- the coastal productivity experiment was analysed and results presented to silviculturists; existing silviculture field experiments were remeasured and several new installations were established; and,
- an in-depth technical review was conducted on the ministry's timber supply analysis system.

Integrated resource management research

The following activities were undertaken:

- research into forest management effects on non-timber resources was continued and new work on biodiversity and old-growth research was begun;
- research on identification and interpretation of ecosystems continued;
- surveys of spotted owl, marbled murrelet, and caribou habitat were conducted;
- operational guides to control soil disturbance and manage landslide-prone terrain were produced;
- forest carbon balance studies were started;
- information on manipulating soil micro-climate to improve forest regeneration was provided; and,
- research on the effects of fertilizer on range forage was completed and an investigation of livestock and sheep grazing on forested areas was continued.

Technical support

Forest researchers were provided technical support through:

- biometrics consulting services;
- the production of extension and demonstration aids; and,
- the supply and maintenance of systems support and research facilities.

Expenditures

Forecast expenditures were $13.5 million. Actual expenditures were $12.1 million, including $3.8 million for regional sciences. The under-expenditure of $1.4 million resulted from the deferral of capital expenditures. (*Table D-1*).

Effects on clients

Forest renewal research
Reforestation effectiveness has been increased through a better understanding of seed origin and handling, genetic tree improvement, and plantation operations.

Forest productivity and decision-support research
New knowledge of silviculture treatment responses and managed stand-yield table information were used to:

- assess the benefits of intensive silviculture;
- improve silviculture practices and investment decisions; and,
- to quantify the impact of the silviculture program on the allowable annual cut.

Integrated resource management research
Clients benefited from publications, courses, and seminars, which outlined strategies and results to improve integrated forest management.

Research program staff participated in consulting sessions with staff and concerned members of the public.

Forecasts

The demand for research solutions, particularly those addressing forest management issues, is expected to continue.

Ensuring a future wood supply with sound reforestation practices will continue to be the driving force behind forest renewal research.

Forest productivity and decision support will continue to produce aids to forest management decisions.

Multiple-use issues and questions will continue to receive major attention. Wildlife habitat, management of old-growth forests, wilderness preservation, and access for non-forestry use will be some of the areas addressed by integrated resource management research.

The research program will continue its extensive and ongoing co-operation with other government agencies and universities. It will also continue its emphasis on addressing client-oriented, high-impact problems and delivering workable solutions.

Forest Protection

Program description and goals

The program's purpose is to:
- protect the forest and range resources from damage by fire, forest insects and diseases;
- protect life, property, and other natural resource values from fire;
- support silviculture site treatments, and range and wildlife habitat creation and maintenance, by using prescribed fires; and;
- provide aviation services to fire suppression and other ministry programs.

The ministry is responsible for forest fire suppression and fire management and the control of insects and diseases.

Fire suppression activities range from fire detection and control, to fire management and site rehabilitation. The forest industry also contributes to program delivery.

The fire management program focuses on providing management personnel and operational staff, and on administering the prescribed-fire and smoke-management programs. The co-operation of other ministries, agencies, and the forest industry is essential in fulfilling this mandate.

The forest, ranching, and wildlife industries co-operate with the ministry and Ministry of Environment to conduct prescribed burning.

The fire management goal is to limit the annual area burned to 69 000 hectares and timber losses to 2.6 million cubic metres. The forest health goal is to reduce timber losses due to forest insects and diseases.

Client situation

The main clients are the public, the forest industry, other ministries, and provincial and federal programs.

Activities

Fire management
This includes all organizational support activities related to fire preparedness, fire prevention, and fire suppression.

In 1990-91, the ministry:
- encouraged public education and assistance programs, such as:
  - Smokey the Bear promotions;
  - school programs; and,
  - the zenith '5555' phone number and advertising;
- dealt with the growing urban/wildland interface problem through program planning;
- researched, updated, and improved fire-fighting equipment;
- continued the fire suppression training program;
- maintained specialty teams and expanded the unit crew program; and,
- undertook staff training in risk management and fire law enforcement.

Forest health program
This includes the prevention and control of forest diseases, insects, and vertebrate animal damage, and the monitoring of pesticide use by the ministry.

In 1990-91, $3.0 million was spent at district and regional offices on bark beetle control activities including:
- aerial damage detection;
- aerial mapping, photography, and ground surveys of infested areas to plan harvesting;
- placing pheromone baits and trap trees to prevent or contain small infestations; and,
- felling and burning, or pesticide treatment, of single infested trees.

Other activities included surveys, trials, and treatment of root diseases, leader weevils, porcupine damage, and others.

Aviation management
The ministry provided aerial services, facilities, and aviation support for all ministry programs.

A total of 47,000 hours were flown for all programs during 1990-91 with a total flying expenditure of $41.7 million with additional expenditures for support facilities:
- $36.1 million for fire suppression flying;
- $5.5 million for other ministry flying; and,
- $2.1 million for development and maintenance of support facilities.

There were two aircraft accidents in 1990. Regrettably, two fatalities and three injuries resulted from these accidents. The 1990-91 aircraft accident frequency is 4.2 accidents per 100,000 hours of flying.

Planning, development, and research
Maintenance and development work continued for:
- fire management and air operations information systems;
- prescribed fire use in forest management;
- the weather station network and lightning location system; and,
- forest health activities.

User support is made easier by manuals and a phone support desk service.

Research was carried out on:
- monitoring smoke production and dispersal from prescribed burns;
- the use of artificial intelligence in site preparation decision-making; and,
- other computer-based systems and models for effective fire, insect, and disease management.

Training
There was a renewed and strengthened commitment to training and safety on the fireline through the creation of a section specifically devoted to training.

This area will be responsible for updating and fully implementing the Fireline Certification Program.

Expenditures

Expenditures were $18.3 million (*Table E-1*).

Effects on clients

The program successfully fulfilled its mandate through:

- effective fire management;
- continued assessment and control of disease and forest pests;
- efficient air operations;
- innovative planning, development, and research in management information systems; and,
- strengthened commitment to fireline training and safety.

Forecasts

According to trends, annual fire starts will continue to increase. The prescribed burning program is expected to level out, but an increased emphasis on smoke management will be required.

There will be new aviation contracts to provide availability of resources and lower flying charges for other ministry programs.

Integrated Resource Management

Program description and goals

The program manages range and recreation resources, integrates their management with timber production and other provincial resources, and co-ordinates the forest planning process.

Under this program, the ministry:

- prepares integrated resource management plans;
- maintains a dialogue with resource agencies, the forest and ranching industries, and the public on objectives and management priorities;
- ensures sound stewardship of forested and non-forested Crown rangelands;
- administers range tenures for forage-use by livestock, and gets a fair price for Crown forage;
- protects provincial forests' recreational values, including landscape aesthetics and wilderness; and,
- provides recreation sites and trails in provincial forests for public use.

Client situation

Major clients are the public, the resource and tourism industries, and other agencies. Plans are designed to integrate the required resources management.

Beef cattle producers, guide outfitters, and others are authorized to harvest almost one million months of grazing for their livestock. Other non-commercial interests also benefit. Forage is supplied for numerous wildlife species.

Developed recreation sites and trails provide the focus for specific recreation activities. Additionally, a vast array of activities are dispersed over provincial forest lands, totalling about 40 million recreation user-days annually.

Recreation resources including landscape and wilderness are inventoried, planned, and protected.

Activities

There are three sub-programs — resource planning, range management, and recreation management — each with its own mandate. These sub-programs, together with all other ministry programs, complement each other to achieve a holistic approach to resource management.

Resource planning

Resource planning achieves integrated resource management by:

- preparing strategic and local resource-use plans;
- co-ordinating inter-agency dialogue;
- consulting the public on forest resource planning;
- addressing environmental protection issues; and,
- recommending timber harvesting rates.

Plans are prepared or approved for:

- 35 timber supply areas;
- 32 tree farm licences; and,
- more than 200 local resource-use plans.

On April 1, 1991, the allowable annual cut was 56.1 million cubic metres from timber supply areas and 18.8 million cubic metres from tree-farm licences.

Range management

This sub-program emphasizes the protection and conservation of Crown range ecosystems while meeting livestock, wildlife, and other resource requirements.

Cost-effective treatments are used to enhance forage production and quality.

During 1990-91, the ministry:

- administered 1,485 permits, 582 licences for grazing, and 38 permits and 31 licences for hay-cutting;
- authorized for livestock, grazing permits, and licences to a total of 989,304 animal-unit-months, 14,889 animal-unit-months more than in 1989-90;
- continued research on the biological control of knapweed and other weeds;
- finalized a review and drafted 11 range policies; and,
- produced a range program review report and summary.

Table F-4 details range improvements on Crown lands; those financed without provincial assistance are not included.

Recreation management

This activity provided the public with opportunities for recreation experiences in provincial forests.

It protected and managed the use of recreational values, including landscape aesthetics and wilderness values.

It provided over 1,300 recreational sites and 5,000 kilometres of trails for the public's use.

The ministry and the Ministry of Lands and Parks carried out the 'Parks and Wilderness for the 90s' project, and held 104 public meetings throughout B.C. at which more than 11,000 people attended.

Undeveloped watersheds on Vancouver Island were documented and accompanying draft maps were prepared.

The Height-of-the-Rockies draft wilderness management plan was released for public review.

A submission recommending the designation of the Swan Lake area as a wilderness area was prepared.

A landscape symposium was held to train ministry and non-ministry personnel in forest landscape management.

Presentations were made at mountain biking and cave management symposiums.

A proposed policy framework for the ministry's Demonstration Forest Program was developed and circulated for comments.

Expenditures

Forecast expenditures were $ 19.0 million. Actual expenditures were $18.8 million (*Table F-1*).

Effects on clients

The ministry develops integrated plans. These plans consider the full spectrum of citizens' desires and industrial needs that the provincial forest land base is expected to provide.

Within this integrated framework, resource management and policy direction are provided for two specific resources: range and recreation.

A continuing supply of quality forage for livestock and wildlife through integrated resource management was achieved along with vital biological control and containment programs for weeds. These programs are coordinated with other ministries and the public sector.

Forecasts

Increasing populations and changing public perceptions about resource management will result in more public and other agency involvement in the ministry program.

More complex issues and increased instances of conflicting expectations will require innovative approaches and the flexibility to find creative solutions for resource planning, and range and recreation management.

The range program's focus will be consistent with recommendations of the program review. A strategic plan for the range sub-program will be prepared.

To date, relatively stable cattle prices have encouraged cattle producers to maintain herd sizes. Increasing wildlife population increases the use of Crown forage.

Increasing demand for forage and other forest resources by the numerous user groups will require increased planning and improved management plans.

Inventory

Program description and goals

This program provides:
- current statistics through periodic re-inventory and depletion updates;
- forest-cover digital files with geo-referenced inventory data;
- updated area-volume digital files on timber supply areas for use in timber supply analysis to assist in determination of the allowable annual cut; and,
- the development and calibration of growth-and-yield models for the estimation and projection of forest stands for inventory reporting resource analysis.

The goals for 1990-91 were to:
- digitize 900 forest-cover map sheets with associated overlays and statistics;
- update 1,500 previously digitized map sheets for depletions;
- re-inventory 420 map sheets;
- calibrate a variable density yield-prediction system for coastal and southern interior species;
- establish, re-measure and/or purchase 800 permanent sample plots;
- establish 70 stem (site) analysis plots;
- ecologically assess 617 permanent sample plots;
- collect volume and decay data for 300 trees;
- produce 500 area-volume and other statistical reports;
- produce seven timber-supply-area area-volume data files for timber supply analyses; and,
- distribute 6,000 geographic-information-system digital-map-sheet data bases to forest regions, forest districts, and the private sector.

Client situation

The program's clients are resource managers and planners in forestry from the private and public sectors.

Within the ministry, inventory data was provided to regional and district planners and managers, and government reporting requirements on forest inventory were supported.

Activities

During the year, a five-year Program Management Plan was developed. This plan will be used to identify inventory needs within the program and to allocate funding on a program specific basis.

The following projects were also accomplished:
- digitizing of 900 forest-cover map sheets with associated overlays and statistics;
- updating of 1,735 previously-digitized map sheets for depletions;
- re-inventory of 420 map sheets;
- calibration of a variable-density-yield prediction system for coastal interior species;
- establishment, re-measurement or purchase of 800 permanent sample plots;
- establishment of 70 stem (site) analysis plots;
- ecological assessment of 500 permanent sample plots;
- production of 750 area-volume and other statistical reports;
- production of area-volume data files for four timber supply areas in support of timber supply analyses; and,
- distribution of 7,500 geographic-information-system digital-map-sheet data bases to forest regions, forest districts, and the private sector.

Expenditures

Forecast expenditures were $14.2 million. Actual expenditures were $13.2 million. (*Table G-1*).

Effects on clients

Up-to-date and detailed forest-cover information is needed in a geo-referenced format for provincial and local planning.

In providing this information to clients, the program contributes directly to improved resource management and planning.

Forecast

The program will:
- re-inventory each timber supply area; maps scheduled: 559;
- update each forest-cover map sheet and corresponding descriptive statistics every two years; maps scheduled: 2,348;
- maintain permanent sample plots for the development of growth-projection systems and the supply of realistic growth models for timber supply analysis; samples maintained: 3,000;
- continue to geo-reference all tentative growth-and-yield samples as well as projection applications to the biogeoclimatic ecological classification system; and,
- implement area-volume, statistical reporting for timber supply areas on an annual basis.

Fire Suppression

Program description and goals

The program endeavors to minimize the damage from wildfires on forest and range lands and the urban/wildland interface zones. It is closely linked to, and supported by, the Forest Protection Program.

The program supplies regional helitack crews, rapattack services, district firetack crews, unit crews, air tankers, and medium helicopter services through the fire-preparedness activities.

It also funds the direct costs of forest-fire control activities, such as the hiring of personnel and equipment, short-term aircraft, and the purchase of fire-fighting materials.

The goal is to limit annual area burned to 69 000 hectares and the volume of timber loss to 2.6 million cubic metres.

Client situation

The program's mandate is to protect the forest and its values, including the allowable annual cut, from uncontrolled wildland fires.

The program has also assumed the responsibility for protecting life and rural, public property from fire.

Activities

Fire preparedness
This involves programs and activities which prepare the Fire Control Organization for the fire season, such as:

- identifying fire-prevention measures and strategies;
- establishing detection and communication networks; and,
- funding a basic level of suppression crews.

Direct fire-fighting
The direct fire fighting activity funds all fireline expenditures.

Equipment and aircraft hired to specifically control a forest fire are funded from this activity, as are hired fire fighters.

Any overtime, standby or fire-site rehabilitation are funded out of this activity.

Suppression crews are a provincial resource and are deployed throughout the province. They involve three-person initial attack and rapattack crews, three-person helitack crews, and 20-person unit crews used on larger, project-type fires.

This program also funds crew and fire-control organization training.

Aircraft availability and equipment development are also funded out of this activity.

Expenditures

The total expenditures in 1990-91 were $25.9 million (*Table I-2*).

In 1991, direct fire fighting expenditures totalled $60.2 million (*Table H-1*).

Effects on clients

The 3 255 fires of the 1990 fire season burned 75 781 hectares and resulted in a timber loss of 5.0 million cubic metres. Both of these figures exceeded the projected 1990 goals of 69 000 hectares and 2.6 million cubic metres respectively.

Forecasts

Initial attack forces will remain the same, but unit crews will be expanded to include native crews. Unit crews work larger fires more efficiently and effectively.

Medium-lift helitacks/rappel helicopters will be contracted and strategically based throughout the province.

Urban/wildland interface will continue to be a priority, with emphasis on smoke management in smoke sensitive areas.

Forest Renewal Silviculture Administration

Program description and goals

This sub-vote provides for administration, policies, and procedures pertaining to reforestation, care, and enhancement of Crown forests, and overall monitoring and functional direction of provincial silviculture activities.

Grants were also provided to enhance silviculture program implementation.

Administrative costs related to the Small Business Forest Enterprise Program were recovered from the Small Business Forest Enterprise Special Account.

Activities

Silviculture administration provides the funding for salaries, benefits, and administration costs associated with the planning, implementing, and monitoring of the Forest Renewal Program.

Client situation

Clients include ministry staff, silviculture contractors, the forest industry, and public.

Expenditures

The forecast expenditures for silviculture administration were $34.4 million. Actual expenditures were $32.5 million. (*Table J-1*).

Effects on clients

Funding from silviculture administration provides for the administrative support required to carry out the extensive provincial silviculture programs.

Forecasts

Administrative responsibilities are expected to increase over the next few years due to expected increases in the overall silviculture program.

Sustainable Environment Fund — Forest Renewal

Program description and goals

The Sustainable Environment Fund was created in 1990 and is administered by the Cabinet Committee on Sustainable Development.

The purpose of the fund is to provide for new or enhanced programs relating to environmental protection and enhancement, and to fund provincial forest renewal and research initiatives.

Forest Renewal Programs
The three sub-programs included under the Forest Renewal Programs section of the fund are:

- Basic Silviculture;
- the Forest Resource Development Agreement; and,
- the Forest Renewal Initiatives Sub-program.

Some projects were completed in co-operation with municipalities and regional districts under the Community Forestry Program.

Basic Silviculture
The goal of the Basic Silviculture sub-program is to reforest areas that are the responsibility of the ministry which have been harvested, burned by wildfire or destroyed by pests.

This includes reforesting areas which were:

- harvested under the Small Business Forest Enterprise Program before January 1, 1988 (ministry outstanding);
- harvested by major licensees between 1982 and October 1, 1987 (industry outstanding); and,
- burned by wildfire or ravaged by pests (fire and pest).

Basic Silviculture also funds operations required to supply seed and seedlings for planting activities under the Forest Renewal and Small Business Forest Enterprise Programs.

These operations include cone-collection, seed-extraction, budgets for the ministry's three nurseries, and commercial nursery contracts.

Operational budgets for the ministry's seed orchards and the tree seed centre are also included.

Forest Resource Development Agreement
The federal/provincial Forest Resource Development Agreement (1985-90) was a five-year, $300-million, cost-shared program.

The agreement's main objectives were to:

- address the backlog of not-satisfactorily-restocked forest lands;
- conduct incremental silviculture (spacing and fertilizing); and,
- provide funding for forestry research.

Although the agreement expired on March 31, 1990, it provided for a sixth year where some of the under-expenditures from previous years could be used.

Forest Renewal Initiatives Sub-Program
This program was established to protect the investments and continue the activities begun under the Forest Resource Development Agreement.

The goal of this sub-program is to improve the health, productivity, and value of immature forest stands.

Activities

Basic Silviculture
Activities include: surveys, site preparation, planting, brushing, and spacing excessively dense stands.

Major licensees deliver a significant portion of these activities, with ministry staff monitoring and auditing their accomplishments.

Forest Resource Development Agreement (FRDA)
Activities funded under this sub-program: planting backlog not-satisfactorily-restocked lands, and publishing research reports funded under the agreement.

Forest Renewal Initiatives Program
Silviculture activities under this initiative included: surveys, site preparation, planting, brushing, spacing, and fertilization. In addition, research projects and support studies into issues — such as silvicultural systems, hardwood management, and integrated resource management — were completed.

Accomplishments of the forest renewal section of the Sustainable Environment Fund are detailed in Table K-2.

Client situation

Clients of the forest renewal section of the Sustainable Environment Fund include major forest licensees, silviculture contractors and associations, forestry consultants, private nurseries, academic institutions, and the general public.

Expenditures

Forecast expenditures for the three Forest Renewal Programs under the Sustainable Environment Fund were $216.2 million. Actual expenditures were $159.0 million (*Table K-1*).

Effects on clients

The reforestation of areas that are the responsibility of the ministry were fully funded.

Contractors, consultants, and private nurseries were widely used.

Funding for incremental silviculture was significantly reduced from previous years, however other programs such as the Community Forestry Program helped offset the reduction.

Forecasts

One of the ministry's objectives is to restock the treatable backlog of not-satisfactorily-restocked forest lands by the year 2000.

It is anticipated that as the ministry's basic silviculture obligations are met, the basic silviculture program will decrease. However, overall silviculture activities are expected to increase significantly to ensure the care of the growing forest. This includes providing for integrated resource management goals, auditing, forest health, and incremental activities.

Silviculture Programs Overview

Silviculture can be divided into two major categories, basic silviculture and incremental silviculture.

Basic silviculture
Basic silviculture ensures the regeneration of young forests on harvested areas and is carried out on all areas harvested on Crown lands.

Activities include:

- surveying — taking inventory of areas and prescribing treatments;
- site preparation — preparing land for planting or natural regeneration;
- planting — producing higher-quality seed and seedlings and establishing them on disturbed areas;
- brushing — controlling competing vegetation to prevent the loss of planted or natural seedlings; and,
- spacing of excessively dense stands — thinning reforested areas to prevent growth limitations due to overcrowding.

Basic silviculture responsibility
Amendments to the *Forest Act* in 1987 made reforestation the obligation of those who harvest Crown timber.

Therefore, major licensees are responsible for reforesting the areas they harvest, and the ministry is responsible for reforesting areas harvested under the Small Business Forest Enterprise Program.

Basic silviculture accomplishments of the major licensees are outlined in Table K-3. The Small Business Forest Enterprise Program's basic silviculture accomplishments are outlined in Table L-5.

To ensure basic silviculture responsibilities are met, the ministry monitors and audits major licensees and oversees the activities under the Small Business Forest Enterprise Program. Results of audits on the licensees are detailed in Table K-4. The Small Business Forest Enterprise Program's audits are detailed in Table L-4.

The backlog of forest lands that were not-satisfactorily-restocked in the past continue to be replanted, with the goal of eliminating most of the treatable sites by the year 2000. Changes in the status of not-satisfactorily-restocked lands on Crown land are presented in Table 6.

Incremental silviculture
In addition to basic silviculture activities, the ministry and some major licensees also conducted incremental silviculture to enhance tree growth and improve wood quality in selected stands.

Activities include:

- site rehabilitation — converting non-commercial forest cover on productive sites to commercially valuable species;
- conifer release — freeing established coniferous trees from competition from non-crop trees and shrubs;
- juvenile spacing — reducing the density of a stand to concentrate the growth on a fewer number of selected trees;
- fertilization — applying fertilizer to promote tree growth on sites deficient in soil nutrients; and,
- pruning — removing lower branches to produce clear, knot-free wood.

Silviculture activity funding
Silviculture activities carried out on Crown land are funded from a number of ministry sources which include:

- Vote 33 — Silviculture Administration;
- the Sustainable Environment Fund;
- the South Moresby Forest Replacement Account; and,
- the Small Business Forest Enterprise Program.

These funding sources are summarized under individual sections within this annual report.

Other non-ministry funded activities also accomplish silviculture goals on Crown land.

Major licensees conduct silviculture activities to meet their basic silviculture obligations (*Table K-3*).

The Forest Enhancement Program, implemented by the ministry but funded by the Ministry of Social Services and Housing, provides income assistance recipients with training, work experience, and a source of income while working on forest improvement projects.

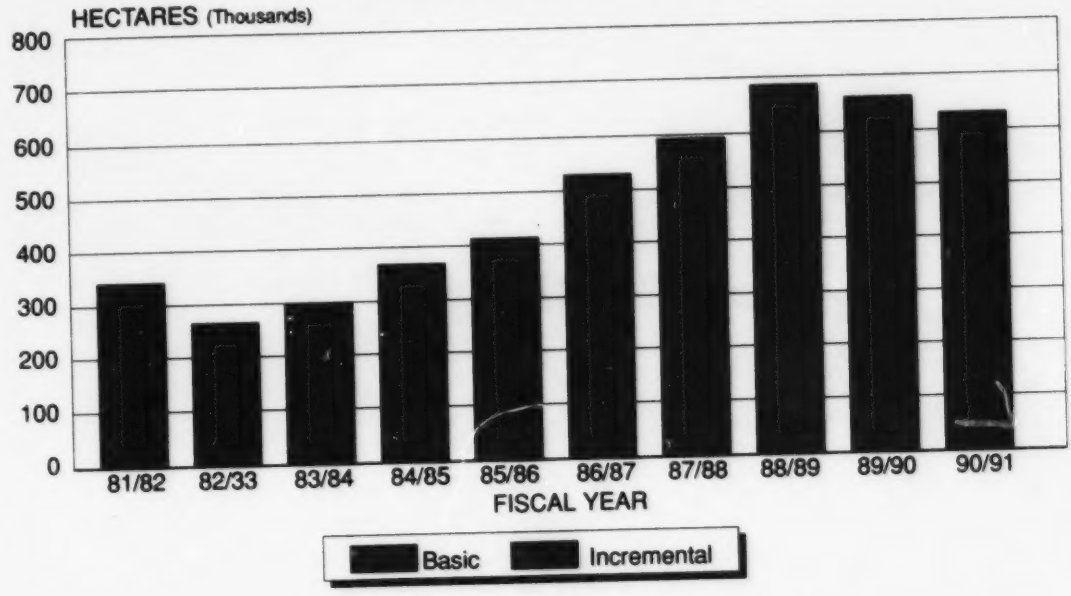
In addition, a number of other job creation initiatives contribute to achieving silviculture objectives.

Table K-14 details the accomplishments of the Forest Enhancement Program and other job creation initiatives. Table K-5 outlines all silviculture accomplishments on Crown land for the fiscal year.

Silviculture trends
Graphs 1 through 10 on the following pages illustrate silviculture accomplishments over the last 10 years.

Graph 1 – Silviculture Surveys on Crown Land

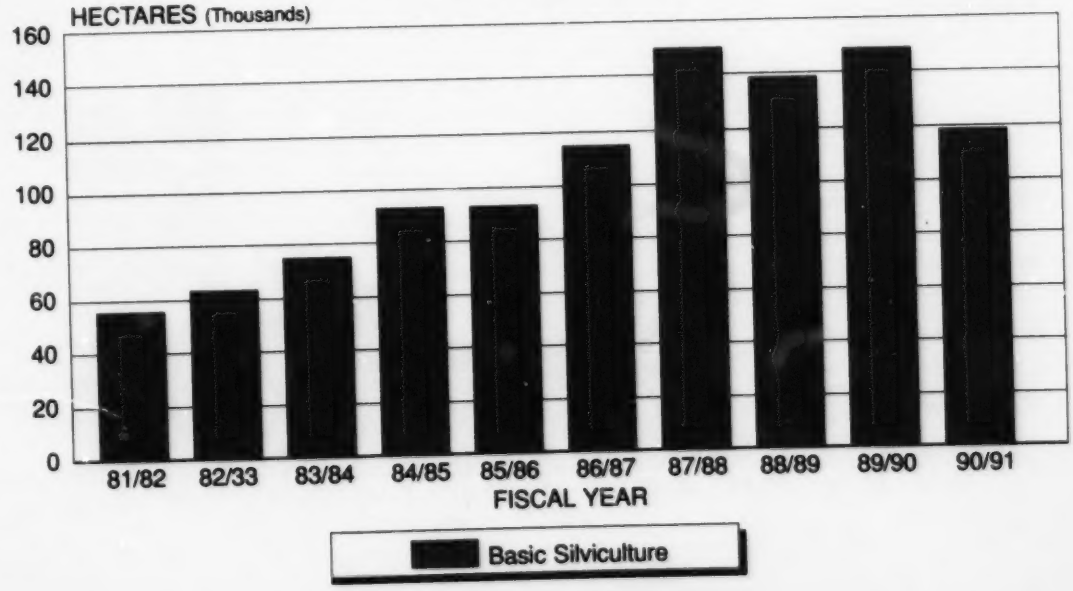
Summary of accomplishments



Silviculture surveying on Crown land doubled in the last 10 years to meet the need for proper planning and monitoring of silviculture activities. It is expected to remain relatively constant for the next five years.

Graph 2 – Site Preparation on Crown Land

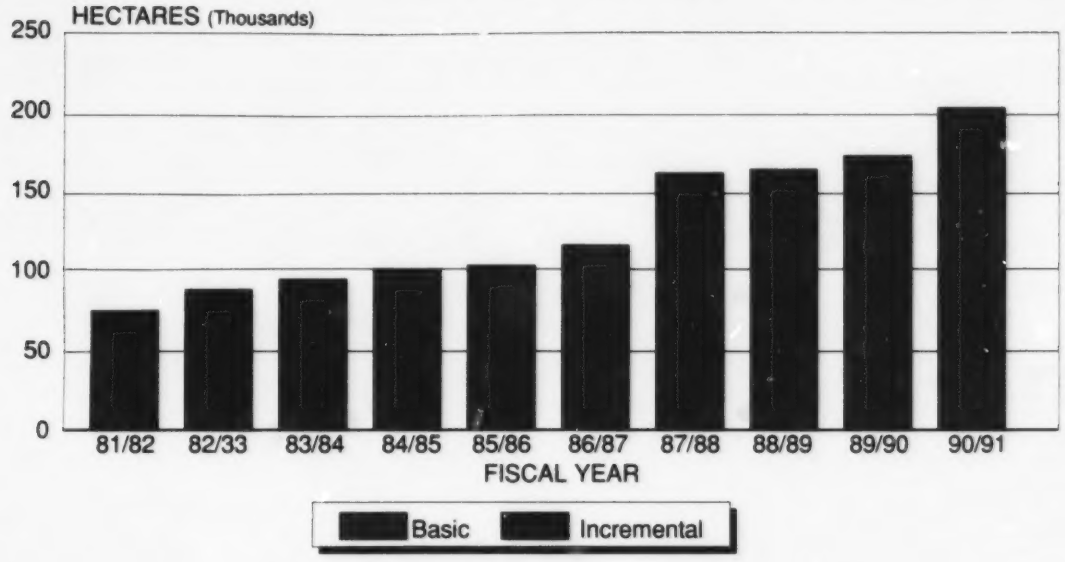
Summary of accomplishments



Site preparation has doubled in the last 10 years from 55 000 hectares in 1981/82 to over 117 000 hectares in 1990-91. There has been a reduction in the proportion of areas slashed burned.

Graph 3 – Planting on Crown Land

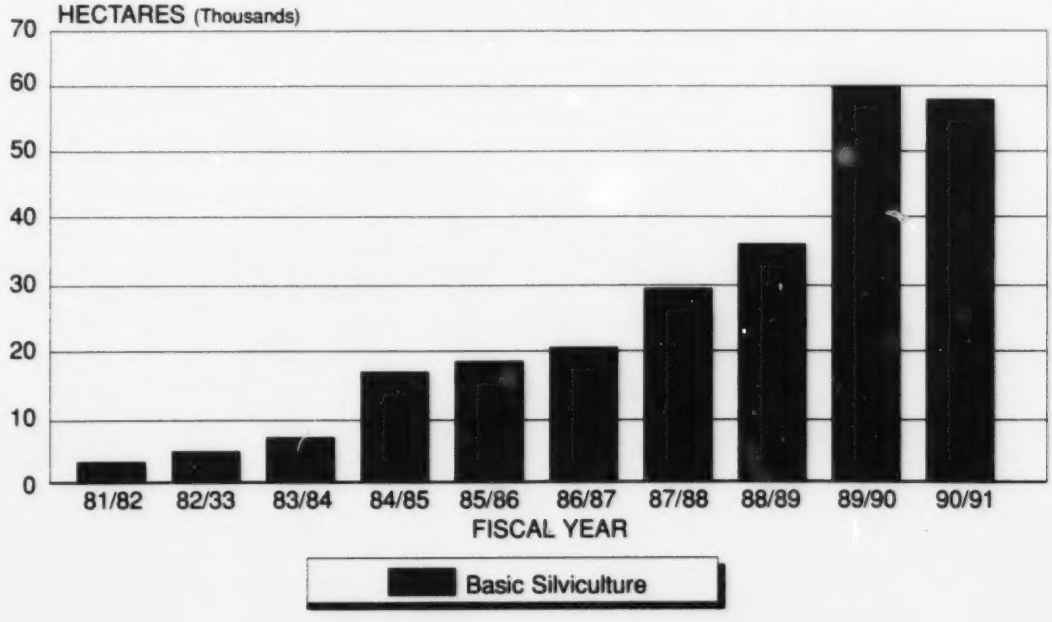
Summary of accomplishments



Planting increased from 70 000 hectares in 1981-82 to over 204 000 hectares in 1990-91.

Graph 4 – Brushing on Crown Land

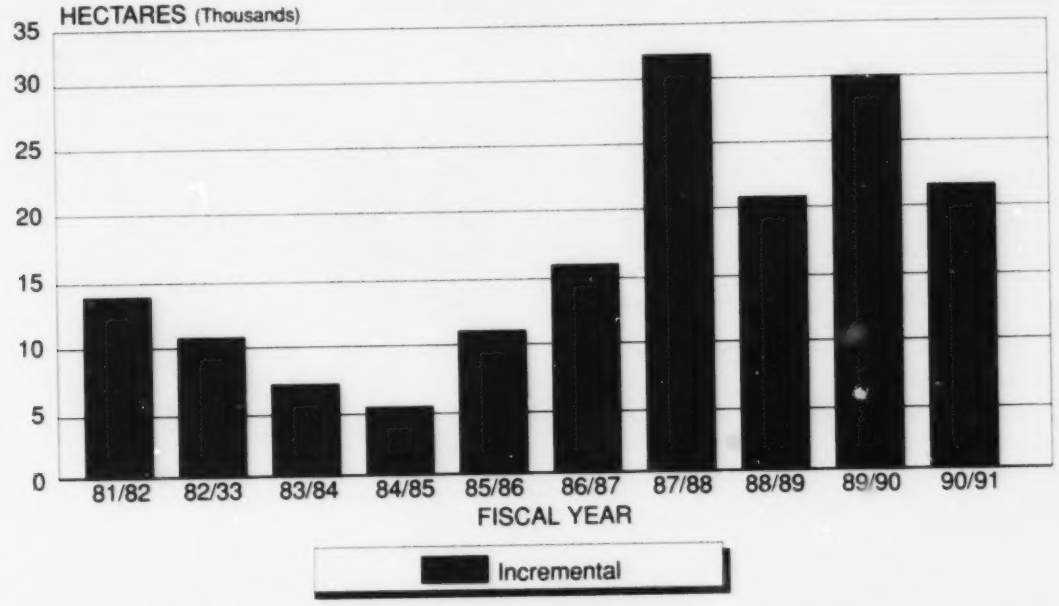
Summary of accomplishments



Brushing levels will remain high because of the need to establish healthy, free-growing forests.

Graph 5 – Juvenile Spacing on Crown Land

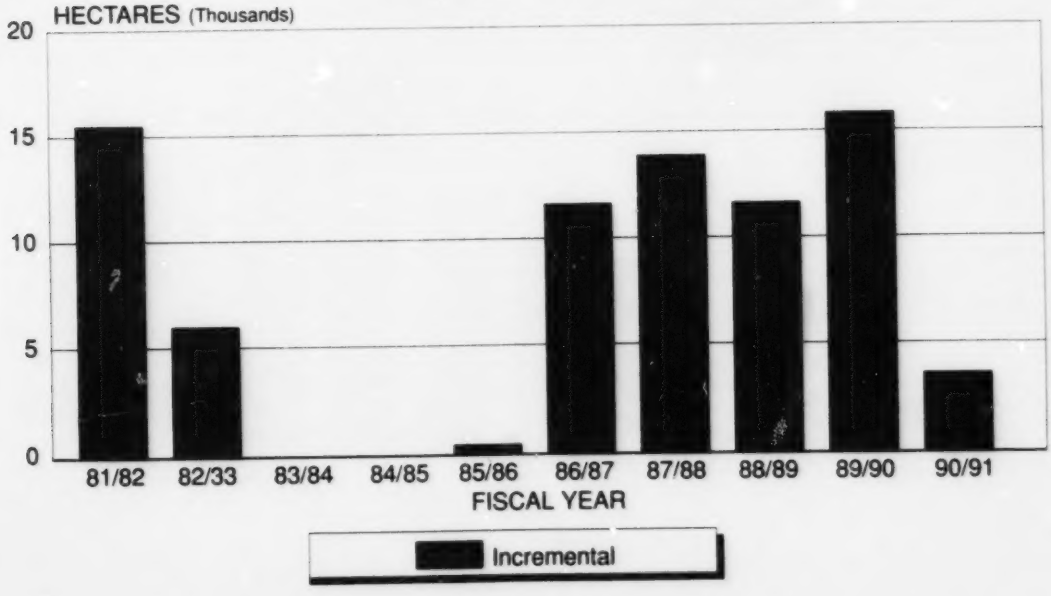
Summary of accomplishments



The trend of spacing young conifers, established under the Canada-B.C. Forest Resource Development Agreement (1985-1990) is expected to continue.

Graph 6 – Fertilizing on Crown Land

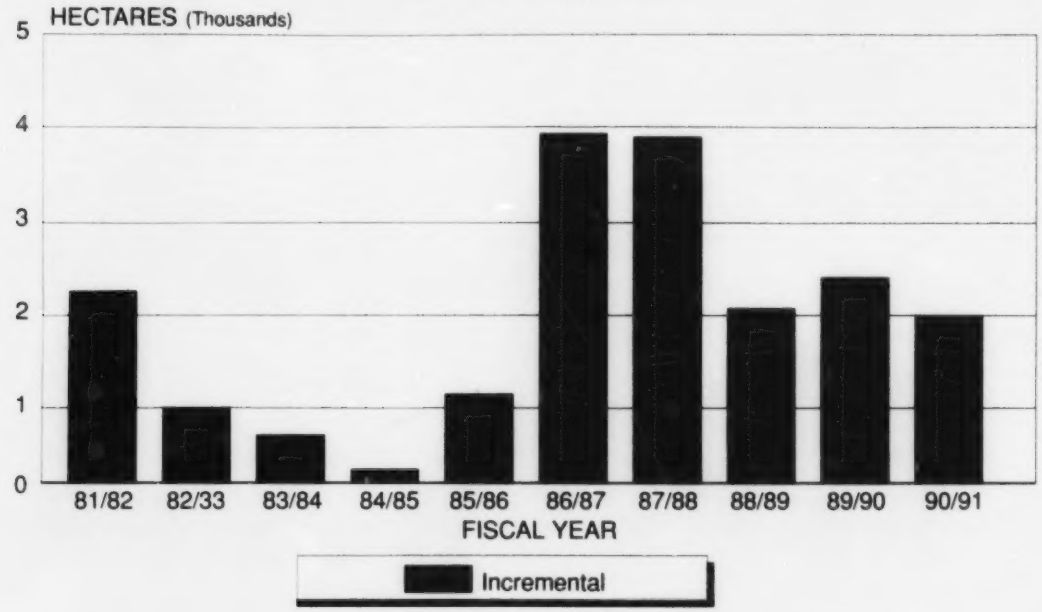
Summary of accomplishments



The level of this activity reflects funding levels. Increased fertilization from 1985-1990 was funded by the Canada-B.C. Forest Resource Development Agreement (1985-1990).

Graph 7 – Conifer Release on Crown Land

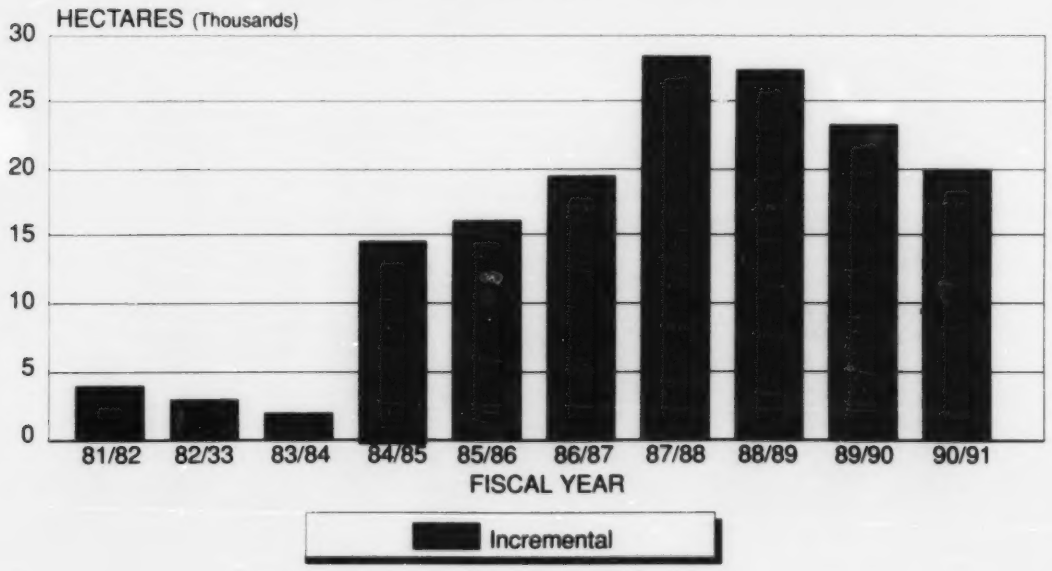
Summary of accomplishments



Freeing older conifers on Crown land from competition was maintained in 1990-91 by the Forest Renewal Initiatives Sub-Program.

Graph 8 – Site Rehabilitation on Crown Land

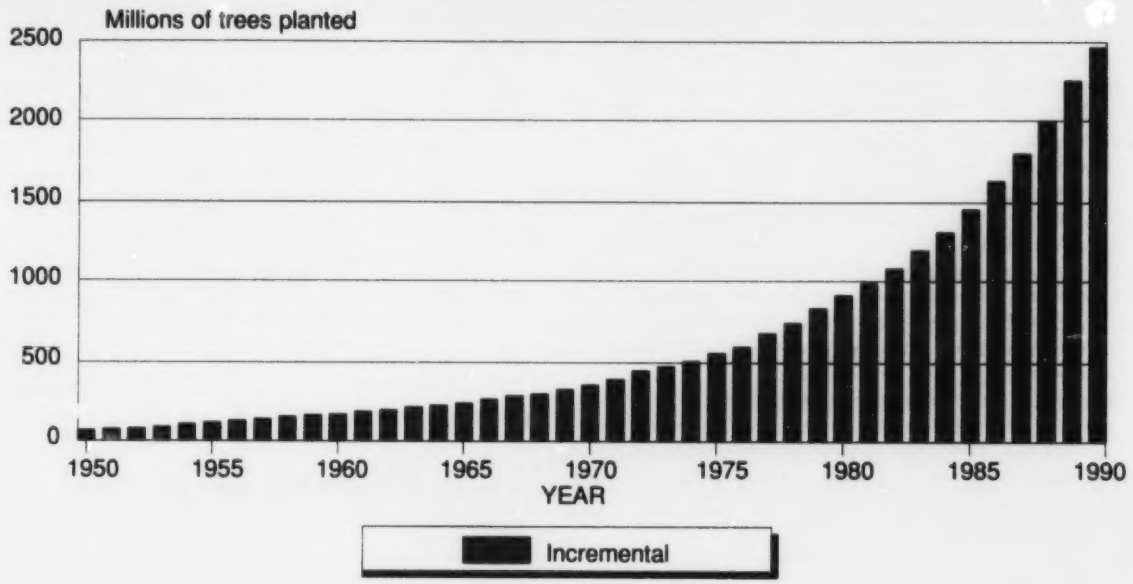
Summary of accomplishments



Site rehabilitation is aimed at reforesting backlog not-satisfactorily-restocked areas.

Graph 9 – Cumulative Total of Trees Planted in British Columbia

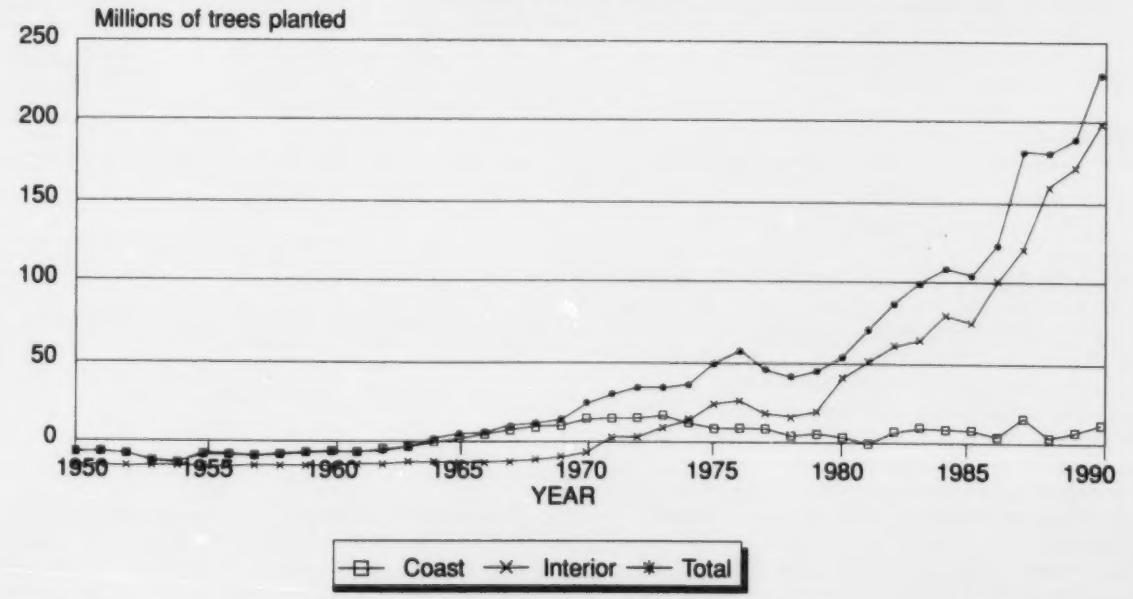
(Planting on all tenures)



Planting began in B.C. in 1930. It took 44 years to plant half-a-billion trees. By 1981, one billion trees were planted. In 1989, the province planted its second billion trees.

Graph 10 – Number of Trees Planted Each Year in British Columbia

(Planting on all tenures)



Until 1974, the majority of tree planting was on the coast. From 1974 to 1991, most of the planting has been in the interior.

Small Business Forest Enterprise Program

Program description and goals

Through this program, Crown timber is sold to individuals and firms registered, or qualified to register, under the program.

The program has four main goals:

- opportunities: for individuals and firms in the forest industry to acquire timber for their operations, and for individuals and firms to enter the industry and establish new businesses;
- diversification and jobs: timber will be sold to promote and stimulate the production of specialty and high-value forest products and to produce jobs; the establishment of new sawmills will not be encouraged;
- competition and profit: timber marketing through a competitive process ensures that the most efficient firms are awarded timber sales and the province receives a fair rate of return for the forest resource; and,
- forest management: sound, integrated, forest management will be demonstrated and encouraged throughout the province.

Client situation

There were 2,296 registrants in the program on March 31, 1991. About 18 per cent of them operated either small sawmills or remanufacturing/specialty plants.

The program provides opportunities for numerous private sector contractors who construct roads, reforest the land, measure and protect the timber resource, and assist in the planning of forest management activities.

Activities

Program development

Two independent reviews of the programs were conducted:

- David Gillespie was commissioned in September 1990 to review the Small Business Forest Enterprise Program and the Woodlot Program; and,
- the Bid Proposal Sales Committee was established in September 1989 to review the existing policies for sales under Section 16.1 of the *Forest Act* and to identify changes which the government could consider to improve the program.

The reports and recommendations were reviewed by the ministry and input from interested parties was sought.

The ministry considers both reports to be positive endorsements. The changes required to address the recommendations are not substantial and do not require major changes to legislation.

Bid proposal sales

Strong interest continues for these sales designed to promote and encourage value-added manufacturing.

During the year, 53 bid proposal sales were awarded, providing about 5.5 million cubic metres of timber to remanufacturers and specialty producers. Successful applicants proposed capital investments totalling $49.1 million, the creation of 1,220 new jobs, and the maintenance of 1,015 jobs.

Volume sold

A total of 11.9 million cubic metres of timber was sold during 1990-91. At the time of sale, the timber was valued at $193.3 million.

Work to support timber sales

Most of the work necessary to support the program's timber sales was conducted by contractors.

Some of the accomplishments were:

- road construction: 679 kilometres; and,
- timber cruising: 8.3 million cubic metres.

Silviculture

Forest lands harvested after January 1, 1988, are restocked under the program. Accomplishments on Crown land under the program are in Table L-5. Silviculture audits are carried out under the program to monitor restocking efforts. Table L-4 summarizes the audits conducted in each region.

Program management

The program is managed on a self-financing basis.

Under the program, the ministry assumes responsibility for the construction of main forest roads and bridges, silviculture, and other forest management requirements that are incidental to operations that yield small business revenue.

The Small Business Forest Enterprise Account receives all revenues and is the source of funding for all program expenditures.

Revenue in excess of the funds required for current expenditures and future silviculture obligations is returned on an annual basis to the province's general revenue fund.

An annual business plan outlines the program's revenue goals and expenditure limits. Program performance is also monitored through quarterly reports submitted to Treasury Board.

Expenditures

The budget for the year was $69.1 million while actual expenditures were $67.4 million. The major expenditure, $24.8 million, was for the construction of roads to provide access to future timber sales. Silviculture expenditures were $17.8 million (*Table L-1*).

Revenues

Revenues for 1990-91 totalled $111.5 million (*Table 1*), based on a total timber volume billed of 7.0 million cubic metres.

Effects on clients

The volume of timber available for sale under the program remained steady throughout the year, providing similar opportunities for loggers and sawmillers as last year. However, significantly more volume has been sold to remanufacturers, leading to potential increases in jobs and new manufacturing capacity.

Forecasts

Weaker forest product markets, evident in 1990-91, are expected to continue into 1992. This will reduce the volume of timber harvested under the program.

It is expected that a number of new manufacturing facilities and plant expansions will come on stream in the next year as a result of previously awarded sales.

South Moresby Implementation

Two special accounts are included under this initiative:

- South Moresby Implementation — Forest Replacement; and,
- South Moresby Implementation — Forestry Compensation.

South Moresby Implementation — Forest Replacement

Program description and goals

The South Moresby Forest Replacement Account was jointly established by the federal and provincial governments.

It was created to help offset the reduction in timber supply and loss of forestry jobs that resulted from the creation of South Moresby National Park in the Queen Charlotte Islands.

As a result of the park's creation, an estimated 147 000 hectares were removed from the timber producing land base in the area.

The federal and provincial governments each deposited $12 million into the account, which is managed by a joint federal/provincial management committee and is implemented by the province.

All funds from the replacement account are limited to projects located in the Queen Charlotte Islands.

Projects can be undertaken on any productive lands, which are committed to long-term forest management, such as provincial timber supply areas and tree farm licences.

Projects can also occur on private, native, municipal, or federal lands.

Eligible projects include communications, forest inventory, silviculture, research, information extension and demonstration, and implementation costs.

To get the most benefits, the replacement account is intended to supplement rather than replace ongoing forestry programs.

Priority is given to projects and treatments that provide the best combination of increased timber production and jobs.

Client situation

The replacement account's client group includes residents of the Queen Charlotte Islands, the forest industry, forestry consultants, and silviculture contractors.

Activities

Enhanced forest management projects, which are incremental to the ongoing programs of the federal and provincial governments and provincial licensees are eligible for funding from the fund.

Eligible activities include:

- special inventories;
- surveys;
- seedling production;
- site preparation/rehabilitation;
- planting;
- brushing;
- juvenile spacing;
- fertilization;
- pest management;
- communications;
- extension and demonstration of information; and,
- implementation of projects.

Accomplishments by activity are detailed in Table M-2.

Expenditures

The forecast expenditures for the replacement account were $3.5 million. Actual expenditures were $3.2 million (*Table M-1*).

Effects on clients

Funding under the replacement account enhanced timber production on the available land base in the Queen Charlotte Islands.

It also increased local job opportunities, with over 90 per cent of the work being completed by forestry consultants and silviculture contractors.

Forecasts

During the year, a proposal was put forward to convert the replacement account into a perpetual account.

The proposal was well received and it is expected that the replacement account will be converted to a perpetual fund within the next year.

This could result in somewhat decreased annual expenditures, but the benefits of the account would be realized over a much longer period of time.

South Moresby Implementation — Forestry Compensation

The compensation account was established in 1988 and is administered by a joint federal/provincial committee.

The compensation account's purpose is to provide for the acquisition of third-party forest interests associated with the establishment of South Moresby National Park.

Expenditures for the year totalled $603,000. Some compensation claims have been completed, while others are still under negotiation.

III. Summary Financial and Statistical Tables

NOTE: All financial data for 1990-91 contained in Section III is based on an accrual accounting system and is unaudited.

Table 1: Revenue in 1990-91, by category, by region

Category	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Stumpage	$36,199	$38,427	$19,877	$105,289	$43,839	$151,409	-	$395,040
Rents and fees	1,511	1,406	1,200	3,933	1,994	6,540	$ 679	17,263
Small Business Forest Enterprise	11,554	9,481	8,684	34,921	22,823	24,019	-	111,482
Royalties	-	502	131	163	583	27,014	-	28,393
Export fees	-	-	2	-	1,871	1,904	-	3,777
Scaling fees	183	248	192	367	161	1,198	-	2,349
Range fees	521	535	130	205	44	5	-	1,440
Interest[1]	219	556	627	920	576	1,590	(27)	4,461
Miscellaneous[2]	42	22	71	147	68	526	8,088	8,964
Totals	$50,229	$51,177	$30,914	$145,945	$71,959	$214,205	$8,740	$573,169

Notes:
1. Victoria had interest adjustments for the year due to a reversal related to the prior fiscal year.
2. Victoria includes $6.9 million in seedling sales under the Sustainable Environment Fund.

Table 2: Expenditure and full-time equivalents (FTEs) in 1990-91, by source of funds

Source of funds	Expenditure		Full-time equivalents[1]	
	Forecast[2]	Actual	Forecast	Actual
	'000		FTEs	
VOTE 30:				
A. Minister's Office	$ 337	$ 331	6.00	6.69
VOTE 31: Ministry Operations				
B. Management Services	100,014	99,949	1,077.50	1,033.72
C. Harvesting	55,235	52,939	945.50	922.41
D. Research	13,511	12,088	171.50	166.40
E. Forest Protection	19,295	18,324	242.00	265.54
F. Integrated Resource Management	19,018	18,801	200.00	181.77
G. Inventory	14,219	13,238	132.00	125.65
VOTE 32: Fire Suppression				
H. Direct Fire Fighting	22,534	60,162		
I. Fire Suppression Preparedness	27,266	25,913	32.00	64.34
VOTE 33: Forest Renewal				
J. Silviculture Administration	34,407	32,495	649.50	641.49
Forest Renewal Programs	-[3]	-	-	-
Totals (voted)	$305,836	$334,240	3,456.00	3,408.01
Special Accounts (Statutory):				
K. Sustainable Environment Fund –Forest Renewal	216,213[4]	159,011	-	-
L. Small Business Forest Enterprise	69,087[5]	67,425	-	-
M. South Moresby Implementation –Replacement	3,430	3,220	-	-
–Compensation	34,880	603	-	-
Totals (Ministry)	$629,446	$564,499	3,456.00	3,408.01

Notes:
1. The concept of full-time equivalent (FTE) is based upon the normal working hours of one full-time employee for a one-year period (1,827 hours) and is used to account for all personnel on a similar basis.
2. Amounts shown reflect the final allocation for the year and include all transfers approved by Treasury Board and the ministry's executive during the year.
3. Reflects transfer of $206.968 million to Sustainable Environment Fund — Forest Renewal *(Table K-1)*.
4. Reflects transfer of $206.968 million from Forest Renewal Program's forecast, transfer of $4.840 million from Small Business Forest Enterprise Program's forecast plus estimated recoveries of $4.405 million from seedling sales.
5. Reflects transfer of $4.840 million to Sustainable Environment Fund — Forest Renewal forecast *(Table K-1)*.

Table 3: Expenditures in 1990-91, by category, by region

Category	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Wages and salaries	$15,237	$18,871	$18,089	$21,312	$16,262	$26,292	$45,494	$161,557
Professional services	16,594	28,844	25,815	48,394	33,077	31,099	39,856	223,679
Other expenses[1]	6,867	12,699	11,512	19,756	10,229	27,642	90,558	179,263
Totals	$38,698	$60,414	$55,416	$89,462	$59,568	$85,033	$175,908	$564,499

Notes:
1. Includes $20.18 million paid to the B.C. Buildings Corporation for occupancy charges incurred throughout the province.

Table 4: Productive forest land[1] in 1990-91 in timber supply areas and tree farm licences, by region

Region	Mature timber[3]	Immature timber[3]	Not stocked[2]	Totals
	'000 hectares			
Cariboo	3 565	2 217	157	5 939
Kamloops	2 435	1 781	228	4 444
Nelson	1 322	1 896	236	3 454
Prince George	9 562	5 748	2 112	17 422
Prince Rupert	6 389	2 097	907	9 393
Vancouver	3 293	1 456	196	4 945
Totals	26 566	15 195	3 836	45 597

Notes:
1. Source: 1990-91 Inventory Branch reports. Includes only productive forest land where timber harvesting is restricted partly or wholly by factors such as timber quality, accessibility and environmental sensitivity. Excludes:
   - Crown forest land in timber licences;
   - all private land;
   - all federal land;
   - provincial parks and miscellaneous reserves; and,
   - non-productive and non-forest lands.

   The province's total area is 94.8 million hectares.
2. Not stocked productive forest land. Includes areas (current and pre-1982 backlog) that were disturbed by harvesting, wildfire or other causes and were not satisfactorily restocked with sufficient trees of acceptable commercial species. The increase in area is due to current disturbances. The increase between 1988/89 and 1989/90 is due to the two-year inventory update schedule. Anticipated regeneration delay may be between one and seven years on current lands that are not satisfactorily restocked. Also includes non-commercial areas, either covered with commercial tree species or 60 per cent or more with brush one or more metres high.
3. Stands with lodgepole pine and whitebark pine or deciduous species as the leading species are immature if the stand age is 80 years or less; when the stand age is greater than 80 years, the stand is mature. Otherwise, all stands having conifers other than lodgepole pine and whitebark pine as the leading species are immature when age is 120 years or less; when the stand age is greater than 120 years, the stand is mature.

Table 5: Deletion of land from provincial forests in 1990-91, by region

Region	Designated use of land deleted					
	Agriculture	Industry and transportation	Parks and recreation	Settlement	Other	Totals
	hectares					
Cariboo	2 875	17	0	184	28	3 104
Kamloops	18	0	260	7	3 572	3 857
Nelson	35	0	70	0	6	111
Prince George	1 115	1 279	0	5	5	2 404
Prince Rupert	5	1	0	3 108	353	3 467
Vancouver	52	0	146 680	15	80	146 827
Totals	4 100	1 297	147 010	3 319	4 044	159 770

Table 6: Changes in the not-satisfactorily-restocked (NSR) Crown land in 1990-91

	Managed forest land					Unmanaged	
	Obligation category					Pre-'82	
	Pre-'82	Ministry	SBFEP	Major Licensees	Total	Low Site[2]	Total
	hectares						
Total NSR at the end of 1989-90[4]	532 288	853 521	96 284	367 257	1 849 350	290 205	2 139 555
Additions to NSR in 1990-91 due to:							
Logging, fire, or pests[3]	1 638	5 945	23 743	97 481	128 806	646	129 452
Plantation failures	11 062	14 129	424		25 615	1 125	26 741
Natural regen. failures	11 778	1 289	108		13 176	2 406	15 581
Total additions to NSR	24 478	21 363	24 275	97 481	167 597	4 177	171 774
Reductions to NSR in 1990-91 due to:							
Planting	38 268	69 847	17 574	81 781	207 470	5 857	213 327
Natural regeneration	34 564	35 246	851	1 735	72 395	10 289	82 684
Reclassification	25 597	3 213	187		28 997	17 458	46 455
Total reduc tions to NSR	98 428	108 306	18 612	83 516	308 862	33 604	342 466
Total NSR at the end of 1990–91	458 338	766 578	101 947	381 222	1 708 085	260 779	1 968 863
Net decrease in Not Satisfactorily Restocked Land in 1990–91					141 265		170 692

This information does not include 2.0 million hectares of pre-1982 not stocked land which is on the Inventory Branch database. The Inventory Branch database is on a 2 year update cycle. Much of the 2.0 million hectares is classified as non-commercial brush or non-commercial timber. Natural restocking is in progress on many of these areas.

Key to obligation category:

Pre-82	Areas primarily treated under Forest Renewal Initiatives Program. Good and medium site areas denuded prior to 1982.
Ministry	Areas denuded by the small business program and licensees. Areas denuded between 1982 and October 1, 1987.
SBFEP	Small Business Forest Enterprise Program. Areas denuded after January 1, 1988.
Major Licensees	Areas denuded by Major Licensees. Areas denuded after October 1, 1987.

Source of information:

Ministry of Forests History Record System[1]
Major Licence Silviculture Information System[1]
TFL reports for areas denuded prior to October 1, 1987

Notes:

1. Information on these systems is updated every six months at a minimum.
2. Poor and low-site class forest land denuded prior to 1982 on the History Records and on TFL reports.
3. Excludes roads and landings created through harvest.
4. Adjustments to NSR figures reported in the 1989-90 annual report are due to late updates to the database.

IV. Detailed Financial Tables

NOTE: All financial data for 1990-91 contained in Section IV is based on an accrual accounting system and is unaudited.

Table A-1: Minister's office expenditures in 1990-91, by category of expenditure

Category	Totals
	--'000
Salaries	$317
Professional services	1
Other expenses	13
Total	$331

Table B-1: Management Services expenditures in 1990-91, by activity

Activity	Totals
	--'000
Deputy minister's office	$ 353
Assistant deputy minister's office	1,427
Financial Services	3,572
Human Resources	2,030
Audit Services	543
Information Systems	19,496
Technical and Administrative Services	26,796
Public Affairs and Library Services	1,723
Policy and Planning	469
Program Administration	
Management	16,200
Administration	11,820
Human Resources	1,228
Technical and Administrative Services	12,497
Relocations and job interviews	1,795
Total	$99,949

Table C-1: Harvesting expenditures in 1990-91, by activity, by region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Timber valuation[1]	$1,083	$1,307	$1,276	$1,688	$1,449	$4,289	$5,598	$16,690
Timber harvesting[2]	1,513	1,786	2,108	2,614	841	2,354	5,441	16,657
Engineering and roads	1,498	2,509	2,845	1,571	2,873	3,332	1,307	15,935
Industry development and marketing	-	-	-	-	-	-	3,657	3,657
Totals	$4,094	$5,602	$6,229	$5,873	$5,163	$9,975	$16,003	$52,939

Notes:
1. Includes $1.698 million in scaling expenditures.
2. Excludes $11.111 million transferred to the Small Business Forest Enterprise Program for administration expense *(Table L-1)*.

Table D-1: Research expenditures in 1990-91, by activity, by region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Management and support	$ 19	$ 16	$ 28	$ 31	$ 16	$ 26	$1,108	$1,244
Technical support group	3	16	-	-	1	13	2,158	2,191
Forest renewal	-	-	-	-	-	-	2,396	2,396
Integrated resource management	-	-	-	-	-	-	1,454	1,454
Forest productivity and decision support	-	-	-	-	-	-	1,049	1,049
Regional sciences	611	529	542	508	852	712	-	3,754
Totals	$633	$561	$570	$539	$869	$751	$8,165	$12,088

Table E-1: Forest protection expenditures in 1990-91, by activity, by region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Administration[1]	$ 376	$1,346	$ 473	$ 750	$ 733	$1,181	$1307	$6,166
Fire management	631	330	1,075	894	627	108	343	4,008
Pest management	956	1,423	1,502	1,062	901	173	656	6,673
Air operations	148	186	150	190	135	31	152	992
Planning development and research	-	-	-	-	-	-	485	485
Totals	$2,111	$3,285	$3,200	$2,896	$2,396	$1,493	$2,943	$18,324

Note:
1. Excludes $0.793 million transferred to the Small Business Forest Enterprise Program for administration expenses *(Table L-1)*.

Table F-1: Integrated resources management expenditures in 1990-91, by activity, region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Administration	$ 36	$ 37	$ 42	$ 51	$ 29	$ 44	$1,086	$1,325
Planning	503	572	847	391	442	1,251	1,619	5,625
Range management	1,081	1,599	935	960	404	6	860	5,845
Recreation management	738	1,017	827	846	632	1,405	541	6,006
Totals	$2,358	$3,225	$2,651	$2,248	$1,507	$2,706	$4,106	$18,801

Table G-1: Inventory expenditures in 1990-91, by activity, region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Administration	$214	$374	$479	$ 618	$ 447	$1,130	$ 787	$4,049
Map loading/digitizing	17	-	20	5	4	-	2,272	2,318
Periodic re-inventory and tree farm licences	251	414	409	1,061	502	54	841	3,532
Growth and yield	124	54	52	42	80	-	842	1,194
Statistics	-	-	-	-	-	-	576	576
Systems operation and maintenance	3	-	-	472	135	24	935	1,569
Totals	$609	$842	$960	$2,198	$1,168	$1,208	$6,253	$13,238

Table H-1: Direct fire-fighting expenditures in 1990-91, by activity, region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Resource availability	$ 401	$ 754	$ 732	$ 830	$ 299	$ 1,034	$ 553	$ 4,603
Direct fire fighting	1,715	2,315	1,363	5,173	1,218	9,486	5,965	27,235
Emergency equipment	-	-	-	-	-	-	3,215	3,215
Fire detection flying	115	135	304	592	155	160	8	1,469
Air tanker support	178	264	158	375	115	1,025	1,249	3,364
Fire support	1,123	1,479	1,142	5,197	1,031	9,651	653	20,276
Totals	$3,532	$4,947	$3,699	$12,167	$2,818	$21,356	$11,643	$60,162

Table I-1: Fire suppression preparedness expenditures in 1990-91, by activity, region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Initial attack crews	$ 606	$ 490	$ 375	$ 748	$ 343	$ 549	$ 3,121	$ 6,232
Detection and surveillance	130	161	266	373	316	52	168	1,466
Weather and fire behavior	238	314	205	177	164	210	30	1,338
Equipment purchases	10	17	40	71	5	44	641	828
Aircraft availability	1	4	2	-	-	1	10,691	10,699
Air tanker bases	140	201	119	218	134	202	1,159	2,173
Planning, research and systems	-	47	74	2	1	88	2,965	3,177
Totals	$1,125	$1,234	$1,081	$1,589	$963	$1,146	$18,775	$25,913

Table J-1: Silviculture administration expenditures in 1990-91 by region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Administration[1]	$2,036	$3,084	$3,011	$4,328	$2,478	$4,073	$13,485	$32,495
Totals	$2,036	$3,084	$3,011	$4,328	$2,478	$4,073	$13,485	$32,495

Notes:
1. Excludes $4.677 million transferred from the Small Business Forest Enterprise Program for administration expenses *(Table L-1)*. Includes expenditures for administration, technical co-ordination, seed & nursery operations & extensions.

Table K-1: Sustainable Environment Fund — Forest Renewal expenditures in 1990-91, by activity, by region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
Basic				'000				
Ministry outstanding	$3,283	$ 3,110	$2,792	$ 6,205	$ 4,925	$4,390	$ 7,301	$ 32,006
Industry outstanding	4,588	10,233	6,771	14,086	10,628	5,604	-	51,910
Fire and pest	717	126	1 084	329	-	-	-	2,256
Seed operations	-	-	-	-	-	-	2,745	2,745
Nursery operations	-	-	-	-	-	-	10,706	10,706
Sub Total	$8,588	$13,469	$10,647	$20,620	$15,553	$9,994	$20,752	$99,623
Forest Renewal Initiatives Program								
Forest Renewal Initiatives	$ 3,755	$ 7,016	$ 9,381	$13,238	$ 5,160	$ 6,354	$ 7,943	$ 52,847
Support studies	-	-	-	274	-	-	4,141	4,415
Sub Total	3,755	7,016	9,381	13,512	5,160	6,354	12,084	57,262
Federal Resource Development Agreement	-	-	-	1,870	-	-	256	2,126
	$12,343	$20,485	$20,028	$36,002	$20,713	$16,348	$33,092	$159,011

Table K-1*: Silviculture expenditures under all ministry funded forest renewal programs in 1990-91, by program, by region.

Funding source	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Ministry sources								
Vote 33 Silviculture Administration[1]	$ 2,036	$ 3,084	$ 3,011	$ 4,328	$ 2,478	$ 4,073	$ 13,485	$ 32,495
Small Business Forest Enterprise Program[2]	1,000	2,319	1,598	6,209	4,917	1,784	-	17,827
South Moresby Replacement Account[3]	-	-	-	-	-	2,779	-	2,779
Sustainable Environment Fund								
–Basic Silviculture[4]	8,588	13,469	10,647	20,620	15,553	9,994	20,752	99,623
–Forest Renewal Initiatives Program[5]	3,755	7,016	9,381	13,512	5,160	6,354	12,084	57,262
–Forest Resource Development Agreement[6]	-	-	-	1,870	-	-	256	2,126
Totals	$15,379	$25,888	$24,637	$46,539	$28,108	$24,984	$46,577	$212,112

Notes:
1. Excludes $4.677 million transferred to Small Business Forest Enterprise Program for administration expenses *(Table L-1)*.
2. Small Business Forest Enterprise Program *(Table L-1)*.
3. South Moresby Forest Replacement Account — excludes research and inventory expenditure *(Table M-1)*.
4. Basic silviculture. Includes 'industry outstanding,' 'ministry outstanding,' and fire and pest programs, seed and nursery operations *(Table K-1)*.
5. Forest Renewal Initiatives Program *(Table K-1)*.
6. Federal-Provincial Forest Resource Development Agreement *(Table K-1)*.

Table L-1: Small Business Forest Enterprise Program expenditures in 1990-91, by activity, by region

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
	'000							
Administration[1]	$1,691	$ 2,446	$1,763	$ 2,453	$ 3,049	$ 4,482	$730	$16,614
Harvesting	1,765	5,440	4,369	4,533	8,191	7,650	75	32,023
Silviculture	1,000	2,319	1,598	6,209	4,917	1,784	-	17,827
Protection	144	217	185	75	249	91	-	961
Totals	$4,600	$10,422	$7,915	$13,270	$16,406	$14,007	$805	$67,425

Note:
1. Transferred from Harvesting ($11.111 million — *Table C-1*), Silviculture ($4.677 million — *Table J-1*) and Protection ($0.793 million — *Table E-1*) programs, plus miscellaneous expenditure ($0.033 million).

Table M-1: South Moresby implementation expenditures in 1990-91, by activity, region[1]

Activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Victoria	Totals
Forest Replacement	'000							
Intensive silviculture	-	-	-	-	-	$2,633		$2 633
Inventory	-	-	-	-	-	189	-	189
Research and demonstration	-	-	-	-	-	252	-	252
Implementation	-	-	-	-	-	146	-	146
Sub-totals	-	-	-	-	-	$3,220	-	3,220
Forestry Compensation	-	-	-	-	-	-	$603	603
Totals	-	-	-	-	-	$3,220	$603	$3,823

Notes
1. South Moresby Island is located in the Vancouver forest region.

Table C-2: Average stumpage prices[1] in 1990-91, by region and species

Region	Balsam		Cedar		Cypress		Douglas-fir	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo	352	6.04	69	2.17	-	-	622	7.05
Kamloops	573	6.60	342	4.40	-	-	1 024	7.65
Nelson	378	5.03	443	3.05	-	-	454	5.33
Prince George	1 561	7.59	19	1.95	*	9.86	276	10.49
Prince Rupert:								
Coast	113	5.33	44	7.70	6	6.05	*	0.25
Interior	1 936	4.85	151	2.99	2	0.24	1	5.27
Total	2 049	4.88	195	4.04	7	4.81	1	5.27
Vancouver:								
Coast	2 510	9.30	3 395	10.88	526	10.58	1 322	9.49
Interior	103	6.46	24	7.14	3	7.77	84	7.58
Total	2 613	9.19	3 418	10.85	530	10.56	1 406	9.38
Totals[1]	7 528		4 485		536		3 783	
Weighted average		$7.13		$9.13		$10.49		$8.12

Region	Hemlock		Larch		Lodgepole pine		Spruce	
	Volume	Price	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo	52	1.37	-	10.74	4 236	4.15	1 526	6.67
Kamloops	174	3.42	75	5.97	2 737	5.26	1 440	7.14
Nelson	322	2.91	206	6.28	1 839	4.54	831	5.63
Prince George	22	3.19	1	4.82	5 075	7.42	6 665	8.58
Prince Rupert:								
Coast	149	5.83	-	-	*	2.24	47	11.46
Interior	1 794	1.35	-	-	1 860	8.38	1 380	7.79
Total	1 943	1.69	-	-	1 860	8.38	1 427	7.91
Vancouver:								
Coast	5 756	10.25	-	-	5	8.62	530	14.77
Interior	51	6.35	-	-	6	7.82	52	7.14
Total	5 807	10.22	-	-	11	8.20	582	14.09
Totals[1]	8 320		282		15 759		12 471	
Weighted average		$7.73		$6.19		$5.94		$8.16

(Table C-2 continued on page 50)

Region	White pine		Other species		All species	
	Volume	Price	Volume	Price	Volume	Price
	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)	(000 m^3)	($/$m^3$)
Cariboo	*	4.40	10	0.59	6 868	5.02
Kamloops	39	5.80	19	5.12	6 423	6.10
Nelson	62	5.77	22	4.65	4 557	4.69
Prince George	-	-	256	0.50	13 875	7.92
Prince Rupert:						
Coast	-	-	*	0.95	359	6.64
Interior	-	-	7	0.39	7 130	5.41
Sub-totals	-	-	7	0.39	7 489	5.47
Vancouver:						
Coast	24	8.16	60	0.94	14 128	10.30
Interior	4	5.04	-	-	327	6.91
Sub-totals	28	7.76	60	0.94	14 454	10.22
Totals[1]	128		374		53 666	
Weighted average		$6.22		$1.05		$7.34

Notes:
1 Figures may not add due to rounding.
2. Based on gross stumpage received on timber billed from tree farm licences, forest licences and timber sale licences. Volume excludes firmwood rejects, waste, and special forest products. Excludes stumpage received from Small Business Forest Enterprise Program sales.
* Indicates volume less than 500 cubic metres.
Since October 1987, most timber has been sold with a single stumpage rate for each stand. These average stumpage rates should be read in that context.

Table C-3: Volume of all products billed[1] in 1990-91, by region, by land status

Land status	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals[5]
	'000 m^3						
Crown land							
• Tree farm licence[2]	132	655	1 256	1 134	1 289	8 368	12 834
• Forest licence	6 251	5 459	3 212	11 935	5 865	5 785	38 507
• Timber sale licence (outside Small Business Forest Enterprise Program)	271	201	71	181	299	71	1 094
• Timber sale licence (Small Business Forest Enterprise Program)	756	817	710	1 936	1 420	1 406	7 045
• Licence to cut	148	35	58	309	96	57	702
Timber licence — stumpage bearing	-	-	-	-	-	-	-
• Royalty within tree farm licence	-	-	-	-	79	2 927	3 006
• Royalty outside tree farm licence	-	109	43	33	48	2 253	2 487
• Woodlot licence	71	56	42	113	54	46	383
• Other[3]	43	55	55	283	131	283	849
Sub-totals	7 671	7 387	5 446	15 925	9 282	21 197	66 908
Private land[4]							
• Within tree farm licence	-	-	6	-	-	424	430
• Within woodlot licence	-	-	-	-	-	-	-
• Outside tree farm licence and woodlot licence	472	832	1 311	924	452	2 789	6 781
Sub-totals	472	832	1 317	924	452	3 213	7 211
Federal land and Indian reserves	15	18	7	13	85	46	185
Totals[5]	8 159	8 238	6 771	16 862	9 818	24 456	74 304

Notes:
1. Includes firmwood rejects.
2. Includes schedule B lands only.
3. Includes rights-of-way, beachcomb, trespass and miscellanea.
4. All Crown-granted lands.
5. Columns may not add due to rounding

Table C-4: Volume of all products billed[1,2] in 1990-91, by region and species

Region	Balsam	Cedar	Cypress	Douglas-fir	Hemlock	Larch	Lodgepole pine	Spruce	White pine	Other	Totals[3]
	'000 m^3										
Coast											
Prince Rupert	219	102	12	*	339	-	4	99	-	1	776
Vancouver	3 910	5 794	783	3 342	9 135	*	17	775	44	319	24 120
Sub-totals	4 129	5 896	795	3 342	9 474	*	21	874	44	321	24 896
Interior											
Cariboo	381	74	-	955	53	*	4 884	1 738	*	74	8 159
Kamloops	659	484	-	1 607	292	120	3 276	1 621	54	125	8 238
Nelson	520	680	-	953	483	347	2 482	1 039	86	180	6 771
Prince George	1 849	28	*	364	37	1	6 145	7 837	-	601	16 862
Prince Rupert	2 206	213	2	2	2 146	-	2 461	1 812	-	201	9 042
Vancouver	104	24	3	88	53	-	6	52	4	1	336
Sub-totals	5 719	1 503	5	3 969	3 063	468	19 253	14 098	144	1 184	49 407
Totals[3]	9 848	7 398	800	7 312	12 538	468	19 274	14 972	189	1 504	74 304

Notes:
1. Includes firmwood rejects.
2. Includes all harvesting on Crown, private and federal lands and Indian Reserves.
* Indicates volume less than 500 cubic metres.
3. Columns may not add due to rounding

Table C-5: Area harvested in 1990-91, by region[7]

Region	Harvesting method	Crown land				Private land				
		TFL[1]	TSA[2]	Other[3]	Sub-total	TFL[4]	TSA[5]	Other[6]	Sub-total	Totals
		hectares								
Cariboo	Clear cutting	756	30 540	532	31 828	-	2 715	-	2 715	34 543
	Selective cutting	-	1 374	257	1 631	-	335	-	406	2 037
	Sub-total	756	31 914	789	33 459	0	3 050	0	3 121	36 580
Kamloops	Clear cutting	1 474	16 622	-	18 096	-	5 342	598	5 940	24 036
	Selective cutting	674	2 905	72	3 651	-	-	-	0	3 651
	Sub-total	2 148	19 527	72	21 747	0	5 342	598	5 940	27 687
Nelson	Clear cutting	1 877	9 773	0	11 650	20	4 541	-	4 541	16 191
	Selective cutting	586	4 784	95	5 465	50	2 302	-	2 302	7 767
	Sub-total	2 463	14 557	95	17 115	70	6 843	0	6 843	23 958
Prince George	Clear cutting	2 517	33 560	460	36 537	0	4 511	151	4 662	41 199
	Selective cutting	47	795	16	858	-	-	-	0	858
	Sub-total	2 564	34 355	476	37 395	0	4 511	151	4 662	42 057
Prince Rupert	Clear cutting	2 021	16 989	202	19 212	377	1 937	251	2 565	21 777
	Selective cutting	-	-	1	1	-	-	-	0	1
	Sub-total	2 021	16 989	203	19 213	377	1 937	251	2 565	21 778
Vancouver	Clear cutting	9 116	13 864	49	23 029	-	5 626	144	5 770	28 799
	Selective cutting	-	1	53	54	-	594	24	618	672
	Sub-total	9 116	13 865	102	23 083	0	6 220	168	6 388	29 471
Subtotal	Clear cutting	17 761	121 348	1 243	140 352	397	24 672	1 144	26 213	166 565
	Selective cutting	1 307	9 859	494	11 660	50	3 231	24	3 305	14 965
Totals		19 068	131 207	1 737	152 012	447	27 903	1 168	29 518	181 530

Notes:
1. Includes Crown land within tree farm licences.
2. Includes Crown land within timber supply areas, excluding tree farm licences.
3. Includes Crown land within woodlot licences, farm leases, federal lands and Indian Reserves.
4. Includes private land within tree farm licences.
5. Includes private land outside tree farm licences.
6. Includes private land within woodlot licences, farm leases, licences to cut, federal lands and Indian Reserves.
7. Includes only blocks where all harvesting is completed.

Table C-6: Volume of logs exported from B.C. in 1990-91, by species

Species	Exported under permit[1]	Other exports[2]	Total
	'000 m^3		
Balsam	181	11	192
Cedar	*	2	2
Cypress	2	21	23
Douglas-fir	29	33	62
Hemlock	254	23	277
Lodgepole pine	23	*	23
Spruce	170	17	179
Other softwood	*	0	*
Cottonwood	5	0	5
Other hardwood	7	5	12
Totals	671	105	776

Notes:

1. Export permit granted under Section 137 of the *Forest Act*. Logs harvested from provincial Crown land, private land within a tree farm licence area, and from private land granted by the Crown after March 12, 1906.
2. No export permit required under the *Forest Act*. Logs harvested from private land that was granted by the Crown prior to March 13, 1906, and is not within a tree farm licence area, and logs harvested from federal land and Indian reserves.

* Indicates volume, less than 500 cubic metres.

Table C-7: Number of licences as of March 31, 1991, by region

Form of rights to timber	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Total
	number						
Regular licences							
Tree farm licence[1]	2	5	5	4	3	14	33
Woodlot licence	90	81	58	163	51	35	478
Forest licence	15	25	30	27	21	55	173
Timber sale licence (pulpwood agreement)	0	0	0	4	0	0	4
Timber sale licence (major)	11	41	30	12	18	50	162
Timber sale licence (minor) SBFEP[2]	152	470	159	194	182	224	1,381
Other[3]	29	74	23	55	26	119	326
Sub-totals	299	696	305	459	301	497	2,557
Temporary licences							
Forest licence [4,5]	10	0	3	5	4	5	27
Timber sale licence SBFEP[6]	3	1	1	0	4	3	12
Sub-totals	13	1	4	5	8	8	39
Totals	312	697	309	464	309	505	2,596

Notes:
1. Tree Farm Licence 25 is in both the Vancouver and Prince Rupert forest regions
2. Small Business Forest Enterprise Program (SBFEP): actual number of licences as at March 31, 1991.
3. Licences issued within the Forest Service reserve. This total includes forest licences in effect on March 31, 1991, and licences for salvage sales, cash sales, free-use permits, etc.
4. Special Forest Licence in Lot 7741 Military Reserve.
5. Special forest licences, e.g., salvage sales.
6. Special timber sale licences.

Table C-8: Volume committed as of March 31, 1991, by region

Form of rights to cut timber	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	'000 m^3						
Regular licences							
Tree farm licence[1]	580	771	1 387	1 041	1 203	13 302	18 284
Woodlot licence	68	68	40	135	43	50	404
Forest licence[3]							
–replaceable	4 528	5 714	3 597	11 705	4 895	7 475	37 914
–non-replaceable	1 575	0	275	945	1 036	212	4 043
Timber sale licence (pulpwood agreement)	0	0	0	1 624	0	0	1 624
Timber sale licence (major)							
–replaceable	0	14	56	11	26	61	168
–non-replaceable	423	65	49	0	495	151	1 183
Timber sale licence SBFEP[2,4]	1 068	1 135	906	2 534	1 373	2 342	9 358
Forest service reserve[2]	173	260	177	525	185	148	1 468
Totals	8 415	8 027	6 487	18 520	9 256	23 741	74 446

Notes:
1. Tree farm licence 25 is in both the Vancouver and Prince Rupert forest regions
2. Timber sales licence SBFEP, includes volume for TSL major were allowable annual cut is 10,000 cubic metres or less. Volume is the allowable annual cut apportioned plus TFL-SBFEP allowable annual cut.
3. Includes non-replaceable forest licences.
4. Includes non-replaceable timber sale licences.

Table C-9: Forest Service road construction, inventory and construction costs in 1990-91, by region, by road size.

Region	Road size[1]	Construction By licensee[2]	By ministry[3]	Current inventory[4]	Construction cost[5]
		kilometres			$'000
Cariboo	Double lane	0	0	855.7	0
	Single lane	7.0	29.2	3 095.7	$ 601.0
	Sub-totals	7.0	29.2	3 951.4	601.0
Kamloops	Double lane	0	0	0	0
	Single lane	6.5	143.2	8 800.8	2,985.5
	Sub-totals	6.5	143.2	8 800.8	2,985.5
Nelson	Double lane	0	0	262.0	0
	Single lane	65.0	125.0	8 163.0	2,394.0
	Sub-totals	65.0	125.0	8 425.0	2,394.0
Prince George	Double lane	62.8	5.1	2 480.9	604.6
	Single lane	59.5	73.9	4 587.6	2,333.1
	Sub-totals	122.3	79.0	7 068.5	2,937.7
Prince Rupert	Double lane	0	1.0	332.0	280.0
	Single lane	27.5	119.4	2 197.0	4,401.0
	Sub-totals	27.5	120.4	2 529.0	4,681.0
Vancouver	Double lane	0	1.0	125.2	0
	Single lane	17.7	52.9	4 052.2	3,290.7
	Sub-totals	17.7	53.9	4 177.4	3,290.7
Provincial Sub-totals	Double lane	62.8	7.1	4 055.8	884.6
	Single lane	183.2	543.6	30 896.3	16,005.3
Totals		246.0	550.7	34 952.1	$16,889.9

Notes:

1. Forest Service road sizes:
   - Double lane, Class 1 (10 metres wide)
   - Class 2 (nine metres wide)
   - Class 3 (eight metres wide)
   - Single lane, Class 4 (six metres wide)
   - Class 5 (five metres wide)
   - Class 6 (four metres wide)
2. Forest Service roads constructed by licensee with the costs reflected in the calculation of each stumpage rate.
3. Includes works approved under the Small Business Forest Enterprise Program and the Emergency Bark Beetle Program.
4. March 31, 1991. Includes transfers to and from other government agencies and private ownership, and cancellations.
5. Licensee costs not included.

Table C-10: Forest Service road improvement, upgrading and maintenance, with costs, in 1990-91, by region, by road size

Region	Road size[1]	Improvements/ upgrading[2] By licensee[4]	Improvements/ upgrading[2] By ministry[5]	Maintenance[3] By ministry[5]	Improvements/ upgrading[6]	Maintenance[6]
		kilometres			$'000	
Cariboo	Double lane	0	60.0	91.0	221.0	$ 127.0
	Single lane	0	168.0	380.0	790.0	268.0
	Sub-totals	0	228.0	471.0	1 011.0	395.0
Kamloops	Double lane	0	0	0	0	0
	Single lane	37.7	99.3	1 065.0	1 344.1	817.9
	Sub-totals	37.7	99.3	1 065.0	1 344.1	817.9
Nelson	Double lane	0	4.0	35.0	4.0	0
	Single lane	8.0	94.0	1 665.0	16.0	1,087.0
	Sub-totals	8.0	98.0	1 700.0	20.0	1,087.0
Prince George	Double lane	172.0	2.0	133.8	31.5	88.3
	Single lane	21.8	28.0	535.1	161.9	176.8
	Sub-totals	193.8	30.0	668.9	193.4	265.1
Prince Rupert	Double lane	100.0	0	1.0	0	270.0
	Single lane	26.0	79.6	379.5	352.4	406.5
	Sub-totals	126.0	79.6	380.5	352.4	676.5
Vancouver	Double lane	0	0	73.8	0	0
	Single lane	10.0	132.2	993.5	1 262.7	636.4
	Sub-totals	10.0	132.2	1 067.3	1 262.7	636.4
Provincial Sub-totals	Double lane	272.0	66.0	334.6	256.5	485.3
	Single lane	103.5	601.1	5 018.1	3 927.1	3,392.6
Totals		375.5	667.1	5 352.7	4 183.6	$3,877.9

Notes:

1. Forest Service road sizes:
   - Double lane, Class 1 (10 metres wide)
   - Class 2 (nine metres wide)
   - Class 3 (eight metres wide)
   - Single lane, Class 4 (six metres wide)
   - Class 5 (five metres wide)
   - Class 6 (four metres wide)
2. Improvement beyond general surface maintenance: all aspects of structural maintenance, including road "reconstruction."
3. Surface maintenance that includes culvert repairs and replacement of small culverts, cleaning of ditches, bank clearing, spot gravelling and surface grading.
4. Forest Service road improvements by the licensee and costs reflected in the calculation of stumpage.
5. Includes works approved under the Small Business Forest Enterprise Program and the Emergency Bark Beetle Program.
6. Licensees' costs are not included.

Table C-11: Forest Service bridge and major culvert construction, inventory and costs in 1990-91, by region, by bridge class

Region	Structure class [1]	Construction [2]			Ministry Cost[6]	
		By licensee[3]	By ministry[4]	Current inventory[5]	Construction	Inspection and maintenance
		number			'000	
Cariboo	P	4	4	66	$173.0	-
	SP	-	-	25	-	-
	T	-	-	78	-	-
	MC	-	-	24	-	-
	Sub-totals	4	4	193	173.0	-
Kamloops	P	-	15	126	793.1	$ 4.7
	SP	1	3	55	110.5	4.2
	T	-	1	398	45.0	13.1
	MC	-	6	53	124.4	1.6
	Sub-totals	1	24	632	1,073.0	23.6
Nelson	P	-	4	86	230.0	26.0
	SP	-	6	126	211.0	26.0
	T	6	2	644	12.0	26.0
	MC	7	4	141	39.0	5.0
	Sub-totals	13	16	997	492.0	83.0
Prince George	P	5	7	195	324.9	32.2
	SP	-	4	83	146.8	12.2
	T	6	8	124	151.7	12.0
	MC	12	7	208	158.1	12.0
	Sub-totals	23	26	610	781.5	68.4
Prince Rupert	P	1	6	84	1,101.8	5.4
	SP	-	-	12	-	5.0
	T	6	7	95	98.0	8.2
	MC	3	5	36	39.9	-
	Sub-totals	10	18	227	1,239.7	18.6
Vancouver	P	10	13	89	699.0	25.5
	SP	-	10	83	156.5	5.5
	T	13	5	546	156.8	66.5
	MC	-	3	53	96.0	-
	Sub-totals	23	31	771	$1,108.3	$97.5
Provincial Sub-totals	P	20	49	646	3,321.8	93.8
	SP	1	23	384	624.8	52.9
	T	31	23	1 885	463.5	125.8
	MC	22	25	515	457.4	18.6
Totals		74	120	3 430	$4 867.5	$291.1

Notes:

1. Ministry of Forests' structure classes:
   - P: Permanent: Any bridge having all of its major components constructed of steel, concrete, or timber that has been pressure-treated with a suitable preservative.
   - SP: Semi-Permanent: Any bridge having a substantial proportion of its components constructed of steel, concrete, or timber that has been pressure-treated with a suitable preservative.
   - T: Temporary: Any bridge having most of its components constructed of untreated wood.
   - MC: Major Culverts: A minimum diameter of 1 800 mm.
2. Includes replacement structures.
3. As approved under 'main access' policy, with cost reflected in the calculation of each stumpage rate.
4. Includes works approved under the Small Business Forest Enterprise Program and the Emergency Bark Beetle Program.
5. March 31, 1991. Includes transfers to and from other government agencies and private ownership, deletions and closures.
6. Licensee costs not included.

Table E-2: Number and causes of wildfires in 1990-91, by forest region

Cause	Cariboo		Kamloops		Nelson		Prince George		Prince Rupert		Vancouver		Totals	
	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average
	number of wildfires													
Lightning	249	154	472	342	245	356	442	317	229	97	378	136	2,015	1,402
Recreation[1]	16	17	50	53	28	27	30	32	37	28	53	53	214	210
Railroads	3	3	11	24	6	10	4	8	0	1	10	11	34	57
Smokers	12	24	38	53	19	30	29	21	4	15	43	47	145	190
Brush burning[2]	20	21	42	31	15	13	50	41	22	22	27	23	176	151
Range burning	12	26	8	7	0	1	2	9	1	2	1	0	24	45
Construction[3]	2	2	1	2	0	1	4	3	2	3	6	4	15	15
Industrial[4]	32	31	22	42	22	36	65	49	23	29	43	53	207	240
Incendiary	36	73	22	25	7	11	11	31	6	13	11	9	93	162
Miscellaneous known causes	60	58	83	83	36	37	32	24	41	40	43	32	295	274
Unknown causes	4	2	8	4	6	2	10	3	5	2	4	3	37	16
Totals	446	411	757	666	384	524	679	538	370	252	619	371	3,255	2,762

Notes:
1. Campers, hunters, fishermen, etc.
2. Excluding railway or right-of-way clearing.
3. Road, power, phone, pipeline, and right-of-way construction.
4. Timber harvesting, mining and other industries.

Table E-3: Area burned by wildfires[1] in 1990-91, by forest region

Region	Merchantable timber		Immature timber		Other cover		Totals	
	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average	1990-1991	10-year average
	hectares							
Cariboo	698	1,292	427	561	1 297	1 284	2 422	3 137
Kamloops	145	800	67	416	698	1 219	910	2 435
Nelson	149	3 901	51	1 729	221	1 488	421	7 118
Prince George	19 245	18 784	14 219	8 392	22 276	26 776	55 740	53 952
Prince Rupert	3 626	17 758	21	8 837	1 846	5 685	5 493	32 280
Vancouver	3 129	1 237	2 852	665	4 814	1 196	10 795	3 098
Totals	26 992	43 772	17 637	20 600	31 152	37 648	75 781	102 020

Note:
1. Includes wildfires on not-satisfactorily-restocked forest land, non-commercial forest land, grazing land, and non-productive sites.

Table E-4: Timber burned by wildfires[1] in 1990-91, by forest region

Region	Merchantable timber	Immature timber[2]	Totals
	'000 m^3		
Cariboo	126.3	26.9	153.2
Kamloops	34.9	4.3	39.2
Nelson	21.0	4.0	25.0
Prince George	1 800.2	837.4	2 637.6
Prince Rupert	380.6	0.8	381.4
Vancouver	1 366.5	422.5	1 789.0
Totals	3 729.5	1 295.9	5 025.4

Notes:
1. Forest cover loss report by region before salvage. Burned timber is salvaged wherever practical.
2. Estimates based on species and generalized information on age and site. Assumes complete mortality.

Table E-5: Area under attack by forest pests[1] in 1990-91, by forest region

Region	Bark beetles[2]	Defoliators	Totals[3]
	hectares		
Cariboo	3 040	14 100	17 140
Kamloops	7 325	194 900	202 225
Nelson	23 075	1 760	24 835
Prince George	19 960	406 750	426 710
Prince Rupert	3 550	-	3 550
Vancouver	870	4 455	5 325
Totals	57 820	621 965	679 785

Notes:
1. Best available estimates of current annual losses as compiled by Forestry Canada. Accuracy varies, depending on the pest.
2. Area of forests killed by bark beetles is estimated from aerial surveys in 1990. Represents trees killed in 1989.
3. Many more pests are endemic throughout most forests. Estimates of area under attack are meaningless for these pests without detailed measures of the intensity of infestation.

Table E-6: Timber damaged by forest pests[1] in 1990-91, by forest region

Region	Bark beetles	Defoliators	Dwarf mistletoes[2]	Root diseases	Totals[3]
	'000 m^3				
Cariboo	53	60	350	221	684
Kamloops	128	835	260	224	1 447
Nelson	401	8	98	58	565
Prince George	348	1 743	262	529	2 882
Prince Rupert	65	0	315	73	453
Vancouver	15	19	355	262	651
Totals	1 010	2 665	1 640	1 367	6 682

Notes:
1. Best available estimates of current annual losses. Accuracy varies, depending on the pest. Only the major forest pests of B.C. are included. Volumes are estimated before salvage. Attacked timber is salvaged wherever practical.
2. Estimates for losses occurring on the net land base for dwarf mistletoes and root diseases.
3. Volume lost to decay in forests exceeding 100 years of age is not included. This is estimated at 10 million cubic metres per year. Nursery and regeneration losses due to other insects, diseases and unwanted vegetation are also not included.

Table F-2: Grazing permits and grazing licences in 1990-91, by region

Region	Permits			Licences		
	Number	Authorized	Used	Number	Authorized	Used
		AUM[1]			AUM	
Cariboo	484	240,210	220,139	142	117,712	113,717
Kamloops	290	139,847	129,975	205	219,066	215,091
Nelson	226	71,353	66,041	40	16,847	16,132
Prince George	351	69,441	57,437	111	81,156	78,107
Prince Rupert	109	10,958	9,867	79	18,552	17,105
Vancouver	25	3,240	1,609	5	922	906
Totals	1,485	535,049	485,068	582	454,255	441,058

Note:
1. AUM or Animal Unit Month is the amount of forage required for one month by an average beef cow, aged six months or older.

Table F-3: Hay cutting permits and hay cutting licences in 1990-91, by region

Region	Permits			Licences		
	Number	Authorized	Used	Number	Authorized	Used
		tonnes			tonnes	
Cariboo	29	435	395	15	329	259
Kamloops	-	-	-	3	106	106
Nelson	-	-	-	1	5	-
Prince George	7	96	96	6	88	11
Prince Rupert	1	6	6	6	121	101
Vancouver	1	100	97	-	-	-
Totals	38	637	594	31	649	477

Table F-4: Range improvements[1] on Crown land in 1990-91, by region

Region	Seeding		Fencing[3]	Weed control[4]	Water development[5]	Other[6]
	Grassland rehabilitation	Disturbed forest land[2]				
	hectares		(kilometers)	hectares	numbers	
Cariboo	-	190	64	2	5	9
Kamloops	-	5 787	90	1 287	36	28
Nelson	65	2 665	266	58	2	-
Prince George	1 838	407	200	49	23	40
Prince Rupert	-	-	21	15	8	8
Vancouver	-	-	2	-	-	-
Totals	1 903	9 049	643	1,411	74	85

Notes:
1. Excludes improvements funded wholly by the Federal Initiative Program and by private sources.
2. Includes seeding of clearcuts.
3. Includes repair, maintenance and construction of fences.
4. Control of knapweed, thistle, etc.
5. Includes repair, maintenance and development of water sources.
6. Includes repair, maintenance and development of trails, corrals, cattleguards, etc.

Table F-5: Average cost[1] of range improvements[2] on Crown land in 1990-91, by region

Region	Seeding[3]		Fencing[4]		Weed control[5]	
	Total activity	By ministry	Total activity	By ministry	Total activity	By ministry
	$/ha		$/km		$/ha	
Cariboo	$53	$50	$2,680	$1,550	$6,456	$6,456
Kamloops	19	15	3,250	1,660	144	143
Nelson	37	22	2,030	-	1,304	1,304
Prince George	72	32	1,212	519	992	992
Prince Rupert	-	-	1,659	814	180	180
Vancouver	-	-	2,840	2,840	-	-

Notes:
1. Based on funds from the Range Management Program, other ministry programs and other sources (on cost-sharing projects).
2. Excludes improvements funded by FEP and exclusively by other non-ministry sources.
3. Combines grassland rehabilitation and seeding of disturbed forest land, mainly clearcuts.
4. Construction of new fences.
5. Includes containment of knapweed, thistle and other weeds.

Table F-6: Recreation site and trail use in 1990-91, by region

Region	Sites Number	Site User visits[1]	Trails Number[3]	Length (kilometres)	Trails User visits[2]
Cariboo	149	170,000	30	588	16,000
Kamloops	378	470,000	100	1,758	129,000
Nelson	249	138,000	174	1,140	87,000
Prince George	250	193,000	78	1,091	71,000
Prince Rupert	88	61,000	37	433	35d,000
Vancouver	186	425,000	126	376	128,000
Totals	1,300	1,457,000	545	5,386	466,000

Notes:
1. Estimates. Based on field surveys.
2. No data for the Lakes District — data lost in district office fire.
3. "Active managed" — Forest Service trails comprise only a small percentage of the many trails which can be found throughout provincial forests. Estimates of numbers and lengths of Forest Service trails is highly dependent on local interpretations of the criteria used to define a trail as "active and managed."

Table K-2: Sustainable Environment Fund accomplishments on Crown Land funded by the ministry[1] in 1990-91, by region[3]

Silviculture activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Surveying	85 161	97 901	120 133	100 843	77 965	71 166	553 169
Preparing sites	7 082	5 069	2 348	6 997	1 777	192	23 465
Planting	9 717	18 529	16 208	34 280	18 888	7 906	105 528
Brushing	4 667	3 676	3 978	17 031	8 132	7 443	44 927
Conifer release	325	23	33	1 108	26	417	1 932
Spacing	5 098	1 813	2 104	2 085	894	3 313	15 307
Fertilizing	0	0	0	0	0	3 426	3 426
Rehabilitation sites	6 587	3 354	1 270	7 060	494	189	17 866
Other[3]	284	284	68	2 436	0	674	3 746
Totals	118 920	130 649	146 142	171 840	108 176	94 726	769 366
	'000						
Seedlings planted	11,149	23,116	17,775	46,592	20,758	5,801	125,191

Notes:
1. Includes accomplishments under basic silviculture, Forest Renewal Initiatives Program and the Forest Resource Development Agreement.
2. Includes pruning, controlling mistletoe and falling snags and residual trees.
3. Includes accomplishments under the Fire & Pest Sub-program, reported separately in the 1989-90 Annual Report.

Table K-3: Basic silviculture accomplishments on Crown land funded by the private sector[1], by region

Silviculture activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Surveying	8 888	2 038	1 990	6 593	1 918	31 318	52 745
Preparing sites	16 148	12 607	7 230	29 653	8 680	2 858	77 176
Planting	8 833	8 296	7 568	28 804	12 275	19 228	85 004
Brushing	6 965	1 719	100	1 758	56	665	11 263
Conifer release	-	-	-	-	-	-	-
Spacing	47	-	162	50	-	112	371
Fertilizing	-	-	-	-	-	-	0
Rehabilitation sites	-	-	-	-	-	-	-
Other[2]	5	-	-	-	-	-	5
Totals	40 886	24 660	17 050	66 858	22 929	54 181	226 564
	'000						
Seedlings planted	12,281	10,849	10,003	36,952	15,712	16,071	101,868

Notes:
1. Includes reported silviculture activities on areas denuded by licensees after October 1, 1987, and on royalty-bearing lands. Silviculture activities are carried out under the supervision of major licensees.
2. Includes pruning, controlling of mistletoe, falling snags and residual trees.

Table K-4: Audit Report on basic silviculture performance on Crown land in 1990-91, by region and licensee

	Number of licences	Total area audited	Basic silviculture in progress: Free-growing likely	Basic silviculture in progress: Free-growing not likely	Area declared free-growing: Accepted	Area declared free-growing: Not Accepted	Penalties: Financial	Penalties: Allowable annual cut
		hectares			% of target	ha	$	m^3
Cariboo[1]								
• Canfor Ltd.	1	95.0	95.0	-	-	-	-	-
• Jacobson Bros. Forest Products Ltd.	1	38.0	38.0	-	-	-	-	-
• Lignum Ltd.	1	110.0	110.0	-	-	-	-	
• Slocan Forest Products Ltd.	1	40.9	40.9	-	-	-	-	-
• Tolko Industries Ltd.	1	59.8	59.8	-	-	-	-	-
• Weldwood of Canada Ltd.	1	178.9	178.9	-	-	-	-	-
• West Fraser Mills Ltd.	1	69.9	69.9	-	-	-	-	-
Sub-totals	7	592.5	592.5	0	0	0	0	0
Kamloops								
• Ainsworth Lumber Co. Ltd.	1	457.0	457	-	-	-	-	-
• International Forest Products Ltd.	1	137.0	137	-	-	-	-	-
• Tolko Industries Ltd.	1	661.0	661	-	-	-	-	-
• Weyerhaeuser Canada	1	62.0	62	-	-	-	-	-
Sub-totals	4	1 317.0	1 317	0	0	0	0	0
Nelson								
• Atco Lumber Ltd.	1	149.0	149.0	-	-	-	-	-
• Bell Pole Co. Ltd.	1	22.1	22.1	-	-	-	-	-
• Columbia River Shake & Shingle Ltd.	2	123.7	123.7	-	-	-	-	-
• Crestbrook Forest Industries Ltd.	3	405.4	286.2	119.2 1	-	-	-	-
• Downie Street Sawmills Ltd.	1	110.2	110.2	-	-	-	-	-
• Evans Products Company Ltd.	3	664.4	606.9	57.5	-	-	-	-
• Fletcher Challenge Canada Ltd.	1	66.1	66.1	-	-	-	-	-
• Kozek Sawmills Ltd.	1	25.0	25.0	-	-	-	-	-
• Pope and Talbot Ltd.	2	662.9	662.9	-	-	-	-	-
• Riverside Forest Products	1	251.0	251.0	-	-	-	-	-
• Slocan Forest Products Ltd.	1	60.8	60.8	-	-	-	-	-
• Westar Timber Ltd.	1	189.7	172.4	17.3	-	-	-	-
• Weyerhaeuser Canada Ltd.	1	205.2	205.2	-	-	-	-	-
Sub-totals	19	2935.5	2741.5	194.0	0	0	0	0

(Table K-4 continued on page 68)

	Number of licences	Total area audited	Basic silviculture in progress: Free-growing likely	Basic silviculture in progress: Free-growing not likely	Area declared free-growing: Accepted	Area declared free-growing: Not Accepted	Penalties: Financial	Penalties: Allowable annual cut
		hectares			– % of target –	– ha –	– $ –	– $m³ –
Prince George								
• Apollo Forest Products Ltd.	3	230.0	128.0	102.0	-	-	-	-
• Canfor Ltd.	22	1 814.1	1 810.9	3.2	-	-	-	-
• Carrier Lumber Ltd.	4	161.8	161.8	-	-	-	-	-
• Dunkley Lumber Ltd.	3	352.6	352.6	-	-	-	-	-
• Enso Forest Products Ltd.	2	145.0	145.0	-	-	-	-	-
• L. and M. Lumber Ltd.	2	148.0	148.0	-	-	-	-	-
• Lakeland Mills Ltd.	3	267.2	267.2	-	-	-	-	-
• Louisiana Pacific Canada Ltd.	2	210.0	205.1	4.9	-	-	-	-
• Northwood Pulp & Timber Ltd.	8	1 061.8	1 061.8	-	-	-	-	-
• P.G. Wood Preserving Ltd.	2	210.9	210.9	-	-	-	-	-
• Rustad Bros. and Co. Ltd.	4	192.4	192.4	-	-	-	-	-
• Stuart Lake Lumber Co. Ltd.	3	305.0	220.0	85.0	-	-	-	-
• Tanizul Timber Ltd.	3	336.0	0.0	336.0	-	-	-	-
• The Pas Lumber Co. Ltd.	4	252.5	252.5	-	-	-	-	-
• West Fraser Mills Ltd.	2	97.2	92.2	5.0	-	-	-	-
• Westar Timber Ltd.	2	204.0	204.0	-	-	-	-	-
Sub-totals	69	5 988.5	5 452.4	536.1	0	0	0	0
Prince Rupert								
• Decker Lake Forest Products Ltd.	1	178.5	178.5	-	-	-	-	-
• Enso Forest Products Ltd.	1	168.3	168.3	-	-	-	-	-
• Fraser Lake Sawmills Ltd.	2	144.5	144.5	-	-	-	-	-
• Houston Forest Products Company Ltd.	2	228.8	228.8	-	-	-	-	-
• International Forest Products Ltd.	1	74.2	74.2	-	-	-	-	-
• Moricetown Band Council	1	24.9	24.9	-	-	-	-	-
• Northwood Pulp and Timber Ltd.	2	311.2	311.2	-	-	-	-	-
• Pacific Inland Resources Ltd.	1	88.1	88.1	-	-	-	-	-
• Repap Smithers Ltd.	1	130.5	130.5	-	-	-	-	-
• Wedeene River Contracting Co. Ltd.	1	280.6	280.6	-	-	-	-	-
Sub-totals	13	1 629.6	1 629.6	0	0	0	0	0

(Table K-4 continued on page 69)

	Number of licences	Total area audited	Basic silviculture in progress		Area declared free-growing			Penalties	
			Free-growing likely	Free-growing not likely	Accepted	Not Accepted		Financial	Allowable annual cut
		hectares			% of target	ha		$	m^3
Vancouver									
• Dane Campbell (WL018)	1	3.2	3.2	-	-	-	-	-	-
• Canadian Forest Products	4	402.5	402.5	-	-	-	-	-	-
• Canadian Pacific Forest Products Ltd.	3	169.6	169.6	-	-	-	-	-	-
• Cattermole Timber Ltd.	1	120.0	120.0	-	-	-	-	-	-
• Crown Forest Industries Ltd.	2	92.0	92.0	-	-	-	-	-	-
• Doman Industries Ltd.	1	114.3	114.3	-	-	-	-	-	-
• Fletcher Challenge Canada Ltd.	8	1 184.4	1 184.4	-	-	-	-	-	-
• Ron Gogo (WL024)	1	6.0	0.0	6.0	-	-	-	-	-
• Greater Vancouver Water District	1	37.0	37.0	-	-	-	-	-	-
• Hecate Logging Ltd.	1	135.7	135.7	-	-	-	-	-	-
• International Forest Products Ltd.	4	520.5	506.3	14.2	-	-	-	-	-
• Kelle Bros Auto	1	2.0	2.0	-	-	-	-	-	-
• Lineham Logging Ltd.	1	46.0	46.0	-	-	-	-	-	-
• MacMillan Bloedel Ltd.	6	1 072.1	1 072.1	-	-	-	-	-	-
• Mayo Forest Products Ltd.	1	62.0	62.0	-	-	-	-	-	-
• Mission Municipality TFL	1	26.0	26.0	-	-	-	-	-	-
• Pretty's Timber Company Ltd.	1	41.0	41.0	-	-	-	-	-	-
• Richply Ltd.	1	29.3	29.3	-	-	-	-	-	-
• Terminal Forest Products Ltd.	1	20.0	20.0	-	-	-	-	-	-
• Texada Logging Ltd.	1	20.0	0.0	20.0	-	-	-	-	-
• Weldwood of Canada Ltd.	4	312.5	312.5	-	-	-	-	-	-
• Western Forest Products Ltd.	2	396.0	396.0	-	-	-	-	-	-
• Allen Woods (WL028)	1	2.0	2.0	-	-	-	-	-	-
Sub-totals	48	4 814.1	4 773.9	40.2	0	0	0	0	0
Totals	160	17 277.2	16 506.9	770.3	0	0	0	0	0

Table K-5: Total silviculture accomplishments on Crown land funded by all sources in 1990-91, by region[1]

Silviculture activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
				hectares			
Surveying	98 465	103 470	127 429	109 873	83 086	104 822	627 145
Preparing sites	25 265	22 181	11 245	42 126	13 736	3 138	117 691
Planting	19 112	28 669	24 913	67 880	35 231	28 472	204 277
Brushing	11 858	5 720	4 344	18 864	8 222	8 653	57 661
Conifer release	325	23	58	1 151	26	419	2 002
Spacing	6 367	2 944	3 281	2 229	1 392	5 483	21 696
Fertilizing	0	0	0	0	0	3 426	3 426
Rehabilitating sites	7 566	3 354	1 270	7 060	494	189	19 933
Other[2]	289	398	236	2 436	0	895	4 254
Totals	169 247	166 759	172 776	251 619	142 187	155 497	1 058 085
				'000			
Seedlings planted	24,335	36,499	29,295	90,190	42,081	23,195	245,595

Notes:

1. Includes accomplishments under:
   - Sustainable Environment Fund
   - South Moresby Forest Replacement Account
   - Small Business Forest Enterprise Program
   - Forest Enhancement and other sources
   - Private sector
   - Other sources
2. Includes pruning, controlling mistletoe, falling snags and residual trees.
   - Ministry Vote
   - Other sources
   - Small Business Forest Enterprise Account
   - Private sector
   - Fire and pest sub-program
   - South Moresby Forest Replacement Account

Table K-6: Site preparation for planting and natural restocking on Crown land in 1990-91, by region[1]

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals[3]
	hectares						
Broadcast burned	4 632	2 148	1 970	11 391	3 788	1 264	25 193
Spot burned	2 185	3 929	906	3 539	1 466	554	12 579
Broadcast mechanical	12 974	14 720	8 024	23 122	7 412	100	66 352
Spot mechanical	2 302	579	261	1 969	710	642	6 463
Broadcast chemical	409	73	6	1 742	9	184	2 423
Spot chemical	0	147	0	282	0	330	759
Other treatments[2]	2 764	584	78	81	351	64	3 922
Totals[3]	25 265	22 181	11 245	42 126	13 736	3 138	117 692

Notes:
1. Includes accomplishments under all sources of funding.
2. Includes mistletoe control, cabling and knockdown of trees over three metres high.
3. Columns may not add due to rounding.

Table K-7: Area planted in 1990-91, by region, by responsibility

	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals[8]
	hectares						
Crown land							
Tree farm licence[1]	954	2 860	6 702	5 252	926	9 431	26 125
Timber supply area[2]							
Licensee[3]	13 847	17 849	10 203	42 629	22 690	15 863	123 081
Ministry[4]	4 311	7 960	8 008	19 998	11 615	3 178	55 070
Sub totals	19 112	28 669	24 913	67 879	35 231	28 472	204 276
Private land							
Tree farm licence[5]	56	0	24	0	0	1 017	1 096
Managed forest land units[6]	0	7	452	0	0	2 955	3 414
Other[7]	0	7	0	0	0	42	49
Sub-totals	56	14	476	0	0	4 013	4 559
Totals[8]	19 167	28 683	25 389	67 879	35 231	32 485	208 835

Notes:

1. Includes Crown land within tree farm licences. On areas harvested after October 1, 1987, planting is paid for by the licensee. On areas denuded prior to October 1, 1987, planting is funded by the ministry. Planting is the licensee's responsibility.
2. Includes Crown land within timber supply areas, excluding tree farm licences, woodlot licences, farm leases, federal lands and Indian reserves.
3. Includes Crown land within timber supply areas. On areas harvested after October 1, 1987, planting is paid for by the licensee. On areas denuded prior to October 1, 1987, planting is funded by the ministry. Planting is the licensee's responsibility.
4. For areas denuded after January 1, 1988, under the Small Business Forest Enterprise Program, planting is funded through the Small Business Forest Enterprise Account. For areas denuded prior to January 1, 1988, planting is funded by the ministry, the Canada-B.C. Forest Resource Development Agreement and the Forest Renewal Initiatives Sub-Program. Planting is the ministry's responsibility.
5. Includes private land within tree farm licences.
6. Includes private land within managed forest land units, but outside tree farm licences.
7. Includes private land outside tree farm licences and managed forest land units.
8. Columns may not add due to rounding.

Table K-8: Trees planted in 1990-91, by region and responsibility

	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals[8]
	'000						
Crown land							
• Tree farm licence[1]	1,269	3,670	8,857	6,245	709	7,399	28,148
• Timber supply area[2]							
• Licensee[3]	17,786	23,270	11,323	57,820	26,914	13,031	150,144
• Ministry[4]	5,280	9,559	9,115	26,126	14,458	2,765	67,303
Sub-totals	24,335	36,499	29,295	90,191	42,081	23,195	245,595
Private land							
• Tree farm licence[5]	18	0	30	0	0	940	987
• Managed forest land units[6]	0	10	468	0	0	2,673	3,151
• Other[7]	0	10	0	0	0	41	51
Sub-totals	18	20	498	0	0	3,654	4,189
Totals[8]	24,353	36,519	29,793	90,191	42,081	26,848	249,784

Notes:

1. Includes Crown land within tree farm licences. On areas harvested after October 1, 1987, planting is paid for by the licensee. On areas denuded prior to October 1, 1987, planting is funded by the ministry. Planting is the licensee's responsibility.
2. Includes Crown land within timber supply areas, excluding tree farm licences, woodlot licences, farm leases, federal lands and Indian reserves.
3. Includes Crown land within timber supply areas. On areas harvested after October 1, 1987, planting is paid for by the licensee. On areas denuded prior to October 1, 1987, planting is funded by the ministry. Planting is the licensee's responsibility.
4. For areas denuded after January 1, 1988, under the Small Business Forest Enterprise Program, planting is funded through the Small Business Forest Enterprise Account. For areas denuded prior to January 1, 1988, planting is funded by the ministry and the Canada-B.C. Forest Resource Development Agreement and the Forest Renewal Initiatives Sub-Program. Planting is the ministry's responsibility.
5. Includes private land within tree farm licences.
6. Includes private land within managed forest land units, but outside tree farm licences.
7. Includes private land outside tree farm licences and managed forest land units.
8. Columns may not add due to rounding.

Table K-9: Trees planted[1] on Crown land in 1990-91, by region, by species

Species	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals[2]
	'000						
Cedar, western red	0	59	524	0	933	6,207	7,722
Cypress	0	0	0	0	0	359	359
Douglas-fir	1,215	4,749	5,367	1,386	20	7,293	20,030
Fir, alpine	0	6	0	83	811	81	981
Fir, amabilis	0	0	0	0	162	2,507	2,670
Fir, grand	0	0	27	0	0	295	322
Hemlock, mountain	0	0	0	0	20	150	171
Hemlock, western	0	0	0	0	1,778	3,430	5,208
Larch, western	0	106	1,166	0	0	2	1,274
Pine, lodgepole	11,742	11,850	7,094	32,107	26,232	143	89,167
Pine, western white	0	19	376	0	0	72	467
Pine, yellow	0	317	134	0	0	30	481
Spruce, Engelmann and white	11,378	19,394	14,606	56,615	11,752	1,103	114,849
Spruce, Sitka	0	0	0	0	373	1,523	1,896
Totals[2]	24,335	36,499	29,295	90,191	42,081	23,195	245,596

Note:
1. Includes trees for both basic and incremental planting.
   Includes trees planted through all funding sources *(Table Q-2)*.
2. Columns may not add due to rounding.

Table K-10: Brushing[1] on Crown land in 1990-91, by region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals[2]
	hectares						
Manual	8 019	4 735	3 843	1 062	3 190	2 541	23 390
Chemical	3 839	985	501	17 802	5 031	6 112	34 270
Totals[2]	11 858	5 720	4 344	18 864	8 222	8 653	57 660

Note:
1. Includes accomplishments under all funding sources.
2. Columns may not add due to rounding.

Table K-11: Average cost[1] of silviculture treatments on Crown land in 1990-91 by region

Treatment	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	B.C.
	$/hectares						
Basic silviculture							
• Surveying[2]	$ 14	$ 10	$ 15	$ 11	$ 14	$ 14	$ 13
• Preparing sites	312	258	425	377	389	570	345
• Planting[3]	481	516	558	484	469	538	499
• Brushing: manual	377	575	878	753	494	625	601
• Brushing: chemical[4]	208	369	349	184	278	455	249
Intensive silviculture							
• Surveying[2]	15	12	15	11	6	11	12
• Backlog planting[3]	430	536	563	523	459	592	515
• Spacing[5]	427	558	804	554	903	900	834
• Fertilizing	0	0	0	0	0	159	159
• Rehabilitating sites	494	380	740	341	720	236	399
• Conifer release	0	0	402	1,003	0	0	933
• Other	244	697	0	0	0	722	471

Notes:
1. Based on site operating costs (equipment, transportation and wages for crew and crew boss).
2. Includes surveys for assessing site treatment, plantation survival and stocking.
3. Excludes cost of seedlings.
4. Includes cost of herbicides.
5. Includes juvenile spacing and sanitation spacing.

Table K-12: Seed additions, withdrawals and inventory in 1990-91, by species[1]

Species	Additions		Withdrawals		
	Natural collections	Seed orchard collections	Ministry nurseries[2]	Private and licensee nurseries[2]	Other[3]
	kilograms				
Cedar, western red	160.8	-	2.9	45.1	16.4
Cypress	80.1	-	-	8.2	0.2
Douglas-fir	1 505.6	202.8	63.9	371.8	175.4
Fir, subalpine	509.3	-	6.5	100.4	6.0
Fir, amabilis	2 348.8	-	16.0	548.9	62.7
Fir, grand	-	-	-	26.5	1.4
Hemlock, mountain	48.1	-	0.5	0.8	0.1
Hemlock, western	113.8	54.7	4.6	30.2	26.3
Larch, western	19.0	-	-	33.7	47.6
Pine, lodgepole	1 397.3	13.5	73.4	591.8	89.3
Pine, ponderosa	-	-	4.1	41.0	4.0
Pine, white	45.8	1.3	2.0	11.1	0.3
Spruce, Engelmann	513.0	-	26.4	123.7	121.3
Spruce, Sitka	6.7	47.8	-	9.7	-
Spruce, white	334.9	-	2.7	259.7	28.9
Spruce, hybrids[5]	483.9	169.0	29.1	253.8	32.7
Miscellaneous	0.6	-	-	0.7	-
Totals	7 567.7	489.1	232.1	2 457.1	612.6

Species	Seed ownership inventory		
	Ministry	Private	Final inventory[4]
Cedar, western red	340.8	276.7	617.5
Cypress	11.3	80.1	91.4
Douglas-fir	9 946.3	3 357.9	13 304.2
Fir, subalpine	935.5	339.3	1 274.8
Fir, amabilis	2 470.0	3 051.2	5 521.2
Fir, grand	685.7	219.8	905.5
Hemlock, mountain	117.0	69.9	186.9
Hemlock, western	426.6	388.1	814.7
Larch, western	419.5	145.6	565.1
Pine, lodgepole	4 830.4	2 965.3	7 795.7
Pine, ponderosa	645.5	220.8	866.3
Pine, white	119.7	446.4	566.1
Spruce, Engelmann	5 409.6	1 589.4	6 999.0
Spruce, Sitka	638.5	173.2	811.7
Spruce, white	4 086.9	349.0	4 435.9
Spruce, hybrids[5]	6 023.8	1 359.4	7 383.2
Miscellaneous	27.3	0.1	27.4
Totals	37 134.4	15 032.20	52 166.6

Notes:
1. Excludes approximately 100 kilograms from exotic species.
2. For sowing of seedlings primarily in 1991-92.
3. For direct seeding, export, seed sales, etc.
4. Anticipated final inventory upon completion of the 1991 spring sowing.
5. Includes natural crosses between Sitka, Engelmann, white and black spruce.

Table K-13: Silviculture accomplishments under the Forest Enhancement Program, and other non-ministry funded programs[1] in 1990-91, by region

Silviculture activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Surveying	-	770	323	0	48	11	3 240
Preparing sites	0	56	15	0	69	0	140
Planting	1	0	2	0	0	25	28
Brushing	226	325	249	75	34	389	1 298
Conifer release	0	0	25	43	0	2	70
Spacing[2]	1 222	1 060	113	94	698	254	3 241
Fertilizing	0	0	0	0	0	0	0
Rehabilitation sites	120	0	0	0	0	0	1 208
Other[3]	0	98	166	0	0	90	354
Totals	3 657	2 309	893	212	649	771	9 579
	'000						
Seedlings planted	1	0	3	0	0	16	20

Notes:
1. The Forest Enhancement Program is funded by the Ministry of Social Services and Housing. Other non-ministry funded programs include Federal Job Creation Programs and Provincial Corrections Programs.
2. Includes juvenile spacing.
3. Includes pruning, controlling of mistletoe, and falling snags and residual trees.

Table L-2: Stumpage revenue[1] from the Small Business Forest Enterprise Program in 1990-91, by region

Regions	Volume billed[2]	Upset Stumpage billed[3]	Bonus Stumpage Billed[4]	Total Stumpage billed	Stumpage billed as a per cent of upset stumpage
	'000 m^3	000'			per cent
Cariboo	756	$ 6,375	$ 4,939	$ 11,314	177
Kamloops	817	4,729	4,710	9,439	200
Nelson	710	4,210	4,286	8,496	202
Prince George	1 936	26,345	9,392	35,737	136
Prince Rupert	1 420	9,034	15,261	24,295	269
Vancouver	1 406	11,284	15,141	26,425	234
Totals	7 045	$61, 977	$53,729	$115,706	187

Notes:
1. Stumpage billed during 1990-91 does not include accruals.
2. Excludes firmwood rejects and waste.
3. Appraised price of timber.
4. Bonus bid for timber, in addition to upset stumpage.

Table L-3: Small Business Forest Enterprise Program in 1990-91, by region

Region	Registrants[1]		Sales			Volume	
	Cat. 1[2]	Cat. 2[3]	Cat. 1	Cat. 2	Other	Sold[4]	Value[5]
	number					'000 m^3	–$'000–
Cariboo	212	37	114	34	4	931	$17,433
Kamloops	324	96	253	77	140	1 465	19,291
Nelson	198	74	95	54	10	847	12,025
Prince George	278	51	106	28	60	4 101	73,801
Prince Rupert	264	63	129	43	10	1 610	26,625
Vancouver	589	110	171	28	25	2 906	44,168
Totals	1,865	431	868	264	249	11 860	$193,343

Notes:
1. On March 31, 1991.
2. Category 1: Registrants who do not own or lease a timber processing facility.
3. Category 2: Registrants who own or lease a timber processing facility.
4. Tendered volume.
5. Value based upon appraised price at time of sale plus bonus bid, if any.

Table L-4: Audit Report on Small Business Forest Enterprise Program's basic silviculture performance on Crown land in 1990-91, by region

Region	Number of licences	Total area audited	Basic silviculture in progress		Area declared free-growing			Penalties	
			Free-growing likely	Free-growing not likely	Accepted	Percent of Target	Not accepted	Financial	Allowable annual cut
		hectares				%	ha	$	m^3
Cariboo	5	302.9	302.9	-	-		-	-	-
Kamloops	7	196.0	196.0	-	-		-	-	-
Nelson	10	191.9	191.9	-	-		-	-	-
Prince George	23	1 159.0	1 104.1	54.9	-		-	-	-
Prince Rupert	14	540.0	209.0	331.0	-		-	-	-
Vancouver	3	96.1	96.1	-	-		-	-	-
Province	62	2 485.9	2 100.0	385.9	-		-	-	-

Table L-5: Basic silviculture accomplishments on Crown land funded by the Small Business Forest Enterprise Program[1], by region

Silviculture activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Surveying	2 328	2 761	4 983	2 437	3 155	2 327	17 991
Preparing sites	2 035	4 449	1 652	5 476	3 210	88	16 910
Planting	561	1 844	1 135	4 796	4 068	1 313	13 717
Brushing	-	-	17	-	-	156	173
Spacing	-	71	902	-	-	-	973
Rehabilitating sites	854	-	-	-	-	-	854
Other[2]	-	16	2	-	-	131	149
Totals	5 778	9 141	8 691	12 709	10 433	4 015	50 767
	'000						
Seedlings planted	904	2,534	1,514	6,646	5,611	1,307	18,516

Notes:
1. Includes all silviculture accomplishments funded through the Small Business Forest Enterprise Account. Includes silviculture activities on areas denuded under the Small Business Forest Enterprise Program after January 1, 1988. Silviculture activities are carried out under the supervision of the ministry.
2. Includes pruning, controlling of mistletoe, and falling snags and residual trees.

Table M-2: Silviculture accomplishments on Crown land funded by South Moresby[1]: Forest Replacement Account

Silviculture activity	Cariboo	Kamloops	Nelson	Prince George	Prince Rupert	Vancouver	Totals
	hectares						
Surveying	-	-	-	-	-	-	-
Preparing sites	-	-	-	-	-	-	-
Planting	-	-	-	-	-	-	-
Brushing	-	-	-	-	-	-	-
Conifer release	-	-	-	-	-	-	-
Spacing[2]	-	-	-	-	-	1 804	1 804
Fertilizing	-	-	-	-	-	-	-
Rehabilitating sites	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-
Totals	-	-	-	-	-	1 804	1 804
	'000						
Seedlings planted	-	-	-	-	-	-	-

Notes:
1. South Moresby Island is in the Vancouver Forest region.
2. Includes juvenile spacing.